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JOSIAH C. TRENT MEMORIAL ISSUE

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JOSIAH CHARLES TRENT, M. D.

1914-1948

Duke University, the medical profession, and the public at large suffered a great loss in the death of Josiah Charles Trent on December 10, 1948. Born in Okmulgee, Oklahoma, on August 7, 1914, the son of Josiah Charles and Mary Simpson Trent, he was the youngest of four children. At an early age he lost through death the guiding hand of his father. However, in the words of his wife, "there stemmed from his early training by his mother and developed in strength throughout the years a deep and abiding faith in God, which was steadfast to the last. He knew that there was something beyond science—and that the order in the universe was proof of God's plan."

Dr. Trent received his A.B. degree from Duke University in 1934 and graduated in medicine from the University of Pennsylvania in 1938. Immediately thereafter, on June 24, he married Mary Duke Biddle, beginning ten and a half years of ideally happy married life with one who understood the problems and hardship of a surgical training, and who ever encouraged him in his efforts. Enthusiastically she exemplified the words of Ruth to Naomi: "Whither thou goest I will go." Working under such stimulating conditions and with an already established interest in the scholarly side of medicine, he crowded into the short time allotted him far more than many accomplish in a full lifetime. This is all the more noteworthy when it is realized that, for the last eight years of his life, he carried on in the shadow of an incurable condition, with increasingly frequent interruptions by operations or treatments.

In order to build on a firm foundation, he began his surgical training with an internship in medicine, which was taken at the Henry Ford Hospital. During the next six years of intensive training in surgery at Duke University Hospital, he found time to put in many hours in organizing and running a blood bank, and was greatly interested in the starting of a Division of Anesthesiology. After the completion of his residency training, he was offered at Duke the choice of an appointment as a junior member of the department in general surgery, or the opportunity of taking over and developing the Division of Thoracic Surgery. His decision was to assume the more exacting responsibilities in thoracic surgery, provided he could have two additional years in which to develop further his abilities in this field. He was given the opportunity, and accepted an appointment as instructor in thoracic surgery at the University of Michigan under Dr. John Alexander.

Approximately one and a half years later the relentless progress of his disease, a lymphosarcoma, heretofore held in check, gave signs of intracranial involvement. Within a few days after a craniotomy, which he knew only relieved the intracranial pressure, he was released at his request from the University of Michigan appointment in order to begin at once the organization of the Division of Thoracic Surgery at Duke Hospital.

During the two years remaining, Dr. Trent made rapid progress in the development of this division—frequently at his own expense, when otherwise there would be unavoidable delay. It was closely correlated with the medical division on chest diseases, by joint conferences and outpatient clinics. Bronchoscopic clinics and conferences in the neighboring tuberculosis sanatoria were also arranged. His greatest interest was the development of a service rendering the best care to the patient and at the same time permitting the highest type of teaching of under-

graduate and graduate students of medicine. Throughout this period he missed no opportunity to pass on his knowledge to colleagues who would later have to carry on, and he encouraged them to take a large part of the operative work. He made repeated efforts to establish a research laboratory in respiratory physiology, but space could not be obtained. However, research was encouraged successfully, under the prevailing inadequate conditions. His efforts bore fruit, and it now seems certain that the research laboratory will soon become a reality.

During these years of intensive training and organizational work, his scholarly, cultural, and humanitarian activities kept pace with the scientific. Having become interested, early in his career, in the history of medicine, he has assembled one of the most outstanding medical historical libraries in this country in private hands. It contains about 5,000 volumes and 2,000 manuscripts, with special collections of Benjamin Rush, S. Weir Mitchell, and Benjamin Waterhouse. There are outstanding collections of manuscripts on anesthesia, on insect transmission of yellow fever, and on vaccination. There are also special collections of pharmacy jars, medical portraits, old surgical instruments, and the largest collection of ivory anatomical manikins in this country. Inscribed over the fireplace in his library is his favorite quotation from George Santayana: "Those who cannot remember the past are condemned to repeat it."

The interest of Dr. and Mrs. Trent as collectors also extended to Walt Whitman, and the Trent Whitman collection (one of the outstanding collections of Whitman books and manuscripts in the United States) was presented to Duke University in honor of their four daughters—Mary, Sarah, Rebecca, and Barbara. In 1945 the University published a catalogue of this collection compiled by Mrs. Ellen Frey Limouze. One of Dr. Trent's last papers was the original publication of a medical case history of Walt Whitman.

During these years he published more than fifty articles, edited in the NORTH CAROLINA MEDICAL JOURNAL the "Thumbnail Sketches of Eminent Physicians," including series of articles on "Eminent Physicians," "The Evolution of the Aseptic Principle in Surgery," "The Story of Yellow Fever," "Obstetrics and Gynecology in America," and "Chapters in the History of Thoracic Surgery."

During 1947 and 1948 he conducted at Duke a series of lectures on the history of medicine. As late as June, 1948, he planned and conducted the historical section at the meeting of the American Medical Association in Chicago, at which time he had pioneers in various fields present papers on their discoveries, his concept being to present "Living Medical History." At the time of his death he was working on two books, which are to be published: "The Life of Benjamin Waterhouse" (Henry Schuman, publishers) and "Surgical Classics" (Charles Thomas, publishers). He served on the editorial board of the NORTH CAROLINA MEDICAL JOURNAL for 1947 and 1948, had been chairman of the Library Committee of the Duke University School of Medicine since 1947, was a member of the editorial board and one of the Founders of the *Journal of the History of Medicine and Allied Sciences*, and was an Honorary Consultant of the Army Medical Library.

From January, 1948, until his death he gave much of his time and effort as a trustee of the Lincoln Hospital, which was originally given by the Duke family for the Negroes of Durham. His thoughts were ever on the side of tolerance, fairness, and better understanding as the essentials in dealing with matters involving racial relationships. He believed that the solution was Christianity and Christ's teachings.

On the side of scientific medicine he was a member of his local, state, and national medical societies, the Society of University Surgeons, the American Trudeau Society, the American Board of Surgery, was an associate member of the American Association for Thoracic Surgery, and was a member of the Founders Group of the American Board of Thoracic Surgery. In 1947 and again in 1948 he was elected secretary-treasurer of his local medical society.

In connection with his cultural and historical activities he was a member of the American Association of the History of Medicine, of the Charaka Club of New York (organized in November, 1898, by a number of medical men of New York City with Dr. Osler as an honorary member, to promote interest in the literary, artistic and historical aspects of medicine), and of the Grolier Club of New York City, one of the oldest clubs in America for book collectors.

JOSIAH CHARLES TRENT, M.D.

1914 - 1948

Much space has been necessary merely to recount the scientific and literary accomplishments of Dr. Trent. The greater emphasis, however, should be placed on the character of the man which enabled him to carry on under conditions of health that would have broken the spirit of most. With his many and varied interests, he found the time for a happy and stimulating home life with his wife and four daughters. During the years of residency training, in view of the connection between his wife and the family which had supported Trinity College and founded Duke University, he lived much of the time in a rented house, lest the acquisition of a home suitable for his family needs be interpreted by some as an indication that he expected to be given a permanent place on the staff. It can be emphatically stated that every appointment he received at Duke was made on the basis of his ability and accomplishments.

My first knowledge of his illness came when he asked me to explore his abdomen for a mass which he had known to be present for a number of months. In reply to the question about the delay, he stated, "I have considered all the possibilities and they are all bad, so I waited for the birth of my baby and then for another Christmas for the family unmarred by my illness." After learning the nature of the mass and the fact that there was involvement of all the mesenteric and retroperitoneal lymph nodes, he never discussed his condition with either colleagues or family, except insofar as was necessary for his subsequent treatment. He did tell his mother shortly before his death that he had been very fortunate in having been given so many years after he had developed an incurable condition.

In summary, I would say that Joe Trent knew early in his medical career what he wanted and what was necessary to get it. Under the shadow of an incurable, but slowly progressive, malignancy he did not waver in his course, but accelerated his pace to counteract the limiting factor of time. Following his operations he returned early to his professional activities rather than take long periods for convalescence. He carried on up to the end, even though he was easily fatigued, ran an intermittent fever, had to take afternoon rest periods, and had his activities interrupted at increasingly frequent intervals by roentgen therapy, or nitrogen mustard therapy and blood transfusions, given in an attempt to control a condition that gradually became more widely disseminated and recurred more rapidly after each treatment.

Here truly was a man of character and determination, cut down early in life, but accomplishing much scientifically, culturally, and in the art of living. Working in the shadow of an illness which he knew could not be conquered, he outdistanced it in accomplishments, ignored it in spirit, and never surrendered to its physical inroads. As one of his colleagues said, "His life was a combination of courage and achievement which was an inspiration to all who knew him. He combined a rare balance of character, fortitude, scholarship, professional ability and personal charm."

DERYL HART, M.D.
Durham

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THE DEVELOPMENT OF MODERN THORACIC DIAGNOSIS

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Improved methods of treatment, whether they be medical or surgical, inevitably follow greater accuracy in diagnosis. Only in proportion to our understanding of disease can we reckon our success in treatment.

Percussion

The story of modern thoracic diagnosis began in the year 1761, when Leopold Auenbrugger, physician-in-chief to the Hospital of The Holy Trinity in Vienna, published his little volume, "Inventum Novum," in which he set down his simple and concise observations on the art of percussion. Despite Rosière de la Chassagne's translation in 1770[1], this great discovery was slighted and remained practically unnoticed until it was reintroduced by Corvisart, the court physician of Napoleon I, in 1808—a year before Auenbrugger's death.

The life of one genius touched the life of another, and we find Laennec, in a day when professional jealousy was even greater than it is today, saying of Auenbrugger:

"I feel confident that physicians who have been regularly, and for some time, engaged in opening dead bodies, will agree with me when I assert that, before the discovery of Auenbrugger, one half of the peri-pneumonies and acute pleurisies and almost all the chronic pleurisies must have necessarily been overlooked; and that, even in the case where the tact of an experienced practitioner led him to suspect one or other of these affections, it was rarely capable of inspiring him with sufficient confidence to pursue a decided course of practice."[2]

Auscultation

We quite naturally think of Laennec as the next important contributor in the field of thoracic diagnosis, and in this generation we glibly and patently dismiss him after noting that he introduced the stethoscope. This he did—and this discovery is one of the most significant in the history of diagnosis. It was, however, the man and his mind that brought greatness to his discovery. Laennec's stethoscope—at first a roll of paper and later a wooden tube—was introduced in 1817[3]. Within the short space of two years, so diligently did he employ this aid to his senses, he was able to publish his immortal work, "De l'auscultation mèdiate," the foundation of modern knowledge on diseases of the chest. Laennec's second edition, "Traitè de maladies des poumons et du coeur," published in 1826, presented disease with respect to diagnosis, pathology (he was an expert pathologist), and treatment. Never before had the diagnostic signs of heart and lung disease been put on so reliable a basis. Osler considered Laennec's description of pneumonia so excellent that he recommended it to his students for study, and Thomas Addison remarked that "Laennec contributed more toward the advancement of the medical art than any other single individual."

Laennec was the first to describe and differentiate bronchiectasis, pneumothorax, hemorrhagic pleurisy, pulmonary gangrene, infarct, emphysema, pulmonary carcinoma, and esophagitis. He defined the anatomic tubercle, or postmortem wart, of tuberculosis. The terms egophony, pectoriloquy, metallic tinkle, and rales—crepitant, mucous, sonorous, and sibilant—began with Laennec. His awareness of the importance of pathologic anatomy in clinical medicine prompted him to introduce it as a course in 1803. Yet, as Castiglioni[4] points out ironically, Laennec's name in medical terminology is not attached to any of his great achievements, but to a description of the hobnail liver, recognized since the days of Hippocrates!

Laennec's discoveries imparted a degree of accuracy to physical diagnosis of the chest that was to remain unamplified until the discovery of x-ray, seventy years later. He died in 1826 at the age of 45—a victim of tuberculosis. His logical successor, Louis, had just finished his apprenticeship at La Charité.

History Taking

Today we have become so hasty in our questioning and examining of patients, and so ready to rely on mechanical aids to diagnosis that we lose sight of the importance of accurate history taking, and forget that this simple means of examination yielded some of the most important discoveries in diagnosis. It is perhaps coincidental that the great men back of these discoveries were particularly interested in diseases of the chest.

Paris was the medical center of the world

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for the first four decades of the nineteenth century. Its great hospitals, Hotel Dieu, La Charité, La Pitié, were crowded with patients, so classified and directed through a central agency that like diseases could be assembled for special study; and when death intervened, autopsies were performed on all bodies. Students not infrequently outnumbered the patients, assembling before daylight to make rounds with the brilliant teachers who vied with one another for patients, students, and clinical renown.

In such an atmosphere worked one of the great figures of the day, Pierre Charles Alexandre Louis[5], introducer of the numerical method into medicine. Born in Aï in 1787, a student in Rheims and a graduate in Paris, Louis practiced in Russia for six years. Frustrated and dissatisfied with the uncertainties he faced in practice and eager for more exact knowledge, he returned to Paris in 1819 and began an apprenticeship at La Charité that lasted seven years. His entire time was concentrated on rigorous, impartial observation. It was here that he formed the habit of carefully questioning patients, making exact notes, and correlating the symptoms, physical signs, and autopsy findings that became the numerical method, the understructure of modern diagnosis. He continued his work at La Pitié.

"I trust that I shall never forget," wrote James Jackson, Jr.[6], "the importance which Louis gives to his first two questions, and the untiring patience with which he repeats them, until he has settled, so far as possible, the truth. **'Depuis quand etes vous malade?'** Perhaps the answer is three days or three weeks; whatever be this answer, however, the first question is invariably followed by a second; **'Avant ce temps-la etiez vous tout a fait bien portent, tout a fait, tout a fait?'** Then follows a most exact investigation of the symptoms, from the first departure from health to the present moment."

With the use of a diagnostic tool of such value, is it any wonder that Louis was the first to diagnose early tuberculosis, or that his pupil, Jules Fournet, in his book on tuberculosis in 1838[7], should be the first to appreciate the significance of the night-sweat, the diurnal temperature rise, anorexia, and the loss of a little weight? On this side of the Atlantic, Gerhard[8], Louis' most brilliant American student, published a treatise in 1836 on diseases of the chest that was the most authoritative work on the subject before the time of Flint.

Bacteriologic Methods

The next step in the refinement of thoracic diagnosis was introduced with the foundation of bacteriology. Koch[9], applying Pasteur's principles, developed the theory of specific infectious disease, and his masterpiece, "The Etiology of Tuberculosis," appearing in 1882, not only proved the specific etiology of this disease, but for the first time set forth the "postulates" for establishing the pathogenic character of a given micro-organism.

Edward Trudeau[10] was one of the first to emphasize the importance of sputum examination in clinical tuberculosis. He was already at work in his cottage sanatorium at Saranac Lake, when he received a translation of Koch's paper as a Christmas present. After reading it he was convinced of the necessity of learning to stain and culture the tubercle bacillus, because this knowledge would help him to clarify certain doubtful cases that were troubling him and might give him a clue to the possible cure of tuberculosis.

Trudeau learned to recognize and grow the organism under the tutelage of Dr. T. Mitchell Prudden, who had worked in Koch's laboratory and was then teaching pathology at The College of Physicians and Surgeons in New York. Summarizing his early experience, Trudeau remarked:

"Like the pilot who, when asked if he knew the harbor, said to the captain he certainly did, for he had been on every rock, my knowledge had not been acquired easily,—and now I could return to Saranac Lake, study some of my doubtful cases by this test, and begin to repeat Koch's work in growing and inoculating the germ."

These "doubtful cases" became early cases when sptum examination revealed tubercle bacilli, even though the physical signs were equivocal or non-existent.

Radiologic Examination

Throughout the nineteenth century the pioneer work of Auenbrugger, Laennec, Louis, Pasteur, and Koch had its effect. The art of observation, physical examination, and deductive analysis reached its highest peak. Little but the rare and the unique was left to describe, and emphasis shifted from diagnosis to *early diagnosis.*

5. Brown, L.(2), p. 120.
6. Brown, L.(2), p. 121.
7. Fournet, J.: Quelques Résultats des Recherches Cliniques sur L'Auscultation des Organes Respiratoires et sur le Premiere Périod de la Phthisie Pulmonaire, Paris, 1839.
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10. Trudeau, E. L.: An Autobiography, Garden City, N. Y., Doubleday Page, 1916, pp. 173-180.

Having so thoroughly exploited these innovations of the preceding century, physicians had in a sense earned a right to the x-ray when Röntgen[11] presented his paper, "Eine neue Art von Strahlen," to the Würzburg Physical Medical Society on December 28, 1895. The experiment which had begun on November 8, 1895, "at a late hour when assistants were no longer to be found," was soon in the hands of eager experimenters on both sides of the Atlantic. The press, quick as always, published the news in the capitals of Europe and America before it appeared locally.

Roentgenology has today become so indispensable an aid to diagnosis that one is startled to recall that fifty years ago it was a physical curiosity. Its detractors were as hard at work as the visionary enthusiasts. When Röntgen made his only formal presentation of his discovery on January 23, 1896, Professor C. Schönbrun warned against too much optimism, since the method scarcely promised to be of much, if any, value in the diagnosis of internal disturbances. By contrast was the attitude of Kölliker, who, on the spot, suggested that the ray Röntgen had modestly designated with the letter "x" be named for its discoverer, and predicted its usefulness in medicine and surgery.

The fluoroscope, perfected by Edison[12] in April, 1896, proved more practical in the early days than the roentgen plate. Gradually, however, improvements in films and exposure control made roentgenography practical, and consistently good results were assured when Coolidge[13] introduced the hot-cathode tube in 1913. Advance in thoracic diagnosis was, of course, hastened by these technical improvements.

Within the specialized field of thoracic roentgenology, imaginative students were seeking for even more intimate glimpses of the lungs and heart than the plain roentgenogram afforded. The stereoscope began with Elihu Thomson's[14] invention in March, 1896; the bronchogram with Chevalier Jackson's[15] suggestion in 1918 that dry bismuth subcarbonate might be insufflated through the bronchoscope; body section technique (planography, laminagraphy, tomography), with Zeide des Plantes'[16] investigations at the turn of the century; and angiocardiography, with the application of intravenous contrast media by Robb and Steinberg in 1938[17].

Bronchoscopy, Cytologic Studies, and Radiocardiography

The precise diagnosis of lesions within the esophagus and bronchi had its beginning in 1869, when Kussmaul[18] attempted to inspect the esophagus through a hollow tube. After O'Dwyer (1885) reaffirmed Green's concept (1828) that the respiratory passage could tolerate a foreign body, this viscus was subjected to visual exploration. Killian's straight, inflexible, unlighted bronchoscope of 1897 and Einhorn's lighted esophagoscope (1909) were combined by Chevalier Jackson in 1904[19] to create the bronchoscope that we use today. Thus lesions suspected from symptoms, physical signs, and roentgen shadow were made to yield to inspection *in situ*, and tissue under suspicion could be removed and studied at leisure under the microscope.

Today one notes an increasing interest in the cytology of sputum. This diagnostic aid was first described by Hampeln in 1887[20], when he found large, atypical epithelial cells in the sputum of a patient with bronchogenic carcinoma. Thirty years later he stressed the diagnostic importance of isolated neoplastic cells, in contrast to those who demanded actual fragments of tumor to make a diagnosis.

Even the atomic age has brought its contribution to thoracic diagnosis. At the meeting of the American Medical Association in Chicago on June 24, 1948, Prinzmetal[21] and his associates read a paper entitled "Radiocardiography: A New Method for Studying the Blood Flow Through the Chambers of the Heart." Utilizing radioactive blood and a specially constructed, ink-writing Geiger-Mueller counter, "it permits the study of certain hemodynamic functions heretofore not possible." The initiation of this diagnostic

11. Röntgen, W. C.: Ueber neue Art von Strahlen. Sitzungsb. d. phys.-med. Gesellsch. zu Würzb., 1895, 132-141.
12. Edison, T. A.: The Edison Fluoroscope. Elect. World 27:360, 1896.
13. Coolidge, W. D.: A Powerful Roentgen Ray Tube with a Pure Electron Discharge. Phys. Rev. 2:409, 1913.
14. Thomson, E.: Stereoscopic Roentgen Pictures. Elect. World 27:280, 1896.
15. Jackson, C.: The Bronchial Tree: Its Study by Insufflation of Opaque Substance in the Living. Am. J. Roentgenol. 5:454, 1918.
16. Worth, T. C.: Personal communication.
17. Robb, G. P. and Steinberg, I. A.: A Practical Method of Visualization of the Chambers of the Heart, the Pulmonary Circulation, and the Great Blood Vessels in Man. J. Clin. Invest. 17:507 (July) 1938.
18. Garrison, F. H.(1), p. 621.
19. Byron, F. X.: The Development of Endoscopy. North Carolina M. J. 9:354-355 (July) 1948.
20. Hampeln, P.: St. Petersburg. med. wschr. n. F., 4:137-139, 1887.
21. Prinzmetal, M. and others: Radiocardiography: A New Method for Studying the Blood Flow Through the Chambers of the Heart in Human Beings. Science 108:340 (Sept. 24) 1948.

tool for the study of heart disease is no more startling than was the presentation of Einthoven's string galvanometer in 1902.

Conclusion

When Louis gave Henry Ingersoll Bowditch his portrait and bade him farewell, he said:

"There is something rarer than the spirit of discernment; it is the need of truth; that state of the soul which does not allow us to stop in any scientific labors at what is only probable, but compels us to continue our researches until we have arrived at evidence."(22)

Diagnosis is, after all, only a search for the truth—the truth about an illness.

22. Bowditch, V. Y.: Life and Correspondence of Henry Ingersoll Bowditch, Boston, 1902, v. 2, p. 275.

SURGICAL TREATMENT OF CERTAIN CONGENITAL MALFORMATIONS OF THE HEART AND GREAT VESSELS

W. C. SEALY, M.D.

DURHAM

The surgical treatment of congenital malformations of the heart and great vessels began in 1939, when Gross[1] reported the first successful ligation of a patent ductus arteriosus. It was not until six years later that the next procedure—resection of the aorta for coarctation—was performed by Crafoord[2] in Sweden. The next important step in this field of surgery soon followed, when Blalock and Taussig[3] reported a successful operation for pulmonic stenosis, offering palliation for the first time to one of the cyanotic groups of congenital heart diseases. Other procedures, such as closure of intra-auricular septal defects, are now being attempted, but are not beyond the experimental stage.

Our experience in the treatment of anomalies of the heart and great vessels has been confined to 15 cases of patent ductus arteriosus[4], 6 cases of coarctation of the aorta, and 3 cases of the tetralogy of Fallot. There has been only one death in the entire group, this occurring in a patient with the tetralogy of Fallot. When it has been possible to complete operation, there have been no complications, and the results have been satisfactory.

Patent Ductus Arteriosus

Patent ductus arteriosus is persistence of the shunt between the aorta and the pulmonary artery that is normally present in intrauterine life. The persistence of this fistula has an effect on the physiology of the circulation similar in many ways to that of a peripheral arteriovenous fistula. The shunt increases greatly the work of the left ventricle, an estimated 20-70 per cent of the left ventricular output going through the fistula. Large fistulas of long duration may cause enlargement of the left ventricle and increased pressure in the pulmonary circulation, with eventual enlargement of the right ventricle. There is usually a wide pulse pressure. In many of the cases evidence of increased pulmonary arterial pressure can be seen on the roentgenogram as an increase in the vascular marking of the lung, while fluoroscopy may show pulsation of the vessels in the hilum of the lung. The turbulence caused by the blood coursing through the duct produces a continuous murmur through diastole and systole, characteristic of any arteriovenous communication. The turbulence also causes certain changes in the vessels that predispose to the development of subacute bacterial endocarditis or endarteritis.

Diagnosis

In patent ductus arteriosus, the most important diagnostic point is the presence of a machinery-like murmur heard best in the second or third interspace, and without this murmur it is impossible to be sure of the diagnosis. Other signs may be an increase in the shadow of the pulmonary artery on the roentgenogram, hilar dance on fluoroscopy, high pulse pressure, and enlargement of the heart (fig. 1-B).

Indications for operation

Operation is indicated in most cases of this anomaly, even though some people with this condition live out their normal life span. The average age of death is 40 years. Bullock and his colleagues[5] have estimated that 53 per

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1. Gross, R. E., and Hubbard, J. P.: Surgical Ligation of a Patent Ductus Arteriosus: Report of First Successful Case, J.A.M.A. 112:729-731 (Feb. 25) 1939.
2. Crafoord, C., and Nylin, G.: Congenital Coarctation of the Aorta and Its Surgical Treatment, J. Thoracic Surg. 14:347-361 (Oct.) 1945.
3. Blalock, A., and Taussig, H. B.: The Surgical Treatment of Malformations of the Heart in Which There is Pulmonary Stenosis or Pulmonary Atresia, J.A.M.A. 128:189-202 (May 19) 1945.
4. The first five cases in the group were reported by the late Dr. Josiah C. Trent in Archives of Surgery 51:106-112 (Sept.) 1945.
5. Bullock, L., T., Jones, J. C., and Dolley, F. S.: The Diagnosis and the Effects of Ligation of the Patent Ductus Arteriosus, J. Pediat. 15:786-801 (Dec.) 1939.

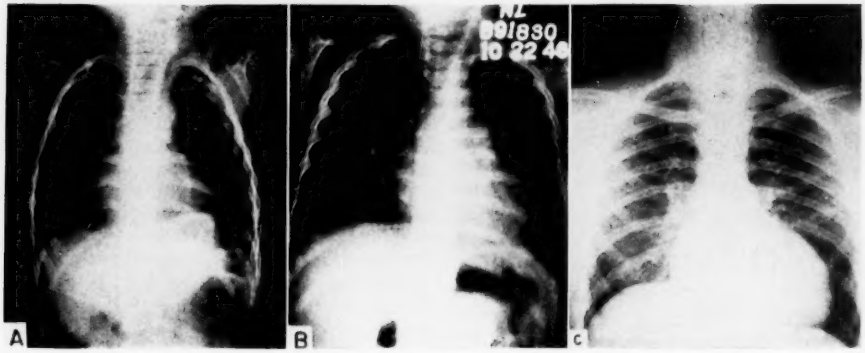

Fig. 1. Roentgenograms demonstrating the findings in the three surgical anomalies of the heart and great vessels. A. Tetralogy of Fallot, probably the extreme type, showing enlargement of the heart, faint vascular markings, and small or absent pulmonary artery. B. Patent ductus arteriosus, demonstrating the very large pulmonary artery, increase in vascular marking in the lung fields, and striking enlargement of the heart. C. Coarctation of the aorta, illustrating marked notching of the ribs, and absence of the aortic knob. The enlarged heart is unusual in this anomaly. The patient had aortic insufficiency and cardiac failure.

cent of the patients die from endocarditis, 23 per cent from congestive failure, and 6 per cent from rupture of the ductus or left ventricular failure. With the use of the antibiotics, the danger of subacute bacterial endocarditis has been greatly decreased, but is still great enough to warrant preventive measures. Some patients above 20-25 years of age, who are asymptomatic, should not be operated upon; but most patients below the age of 20 deserve the benefit of interruption of the patent ductus.

Technique of operation

The operative procedure is simple to perform. At this clinic a high posterolateral thoracotomy incision is used, as this gives better exposure and more room in which to work. Gross[6] now advocates complete division of the ductus, but in our experience simple ligation (fig. 2) has proven adequate. The latter procedure is performed according to Gross's original communication[1]. The use of cellophane or polythene around the duct to stimulate fibrosis has been abandoned because of the confusion about the biological properties of these various substances.

Results

Fourteen of the 15 patients in this group had simple ligation of the duct with no serious postoperative difficulties and no apparent recanalization of the duct. In one case complete interruption of the ductus was not performed, because the duct was torn during its isolation; in subsequent follow-up examinations, however, the diastolic phase of the murmur had disappeared. In one case the murmur was present immediately after operation, and persisted throughout the eight months that the patient was followed; the size of the left ventricle has decreased, however. In only one instance has complete division been accomplished; in this case, during the isolation according to the technique described by Gross, the attachment of the ductus to the aorta was torn. Hemostasis was possible only after doubly clamping the aorta for twenty-one minutes. Since the results in our other cases have been good with simple

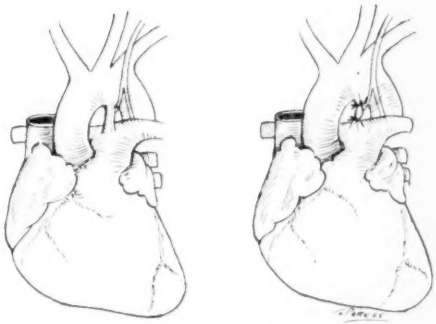

Fig. 2. Drawing of a patent ductus arteriosus, demonstrating the relationship of the recurrent nerve and the ductus. The figure on the right shows the ductus ligated in continuity.

6. Gross, R. E.: Complete Surgical Division of the Patent Ductus Arteriosus: A Report of 14 Successful Cases, Surg., Gynec., and Obst. 78:36-43 (Jan.) 1944.

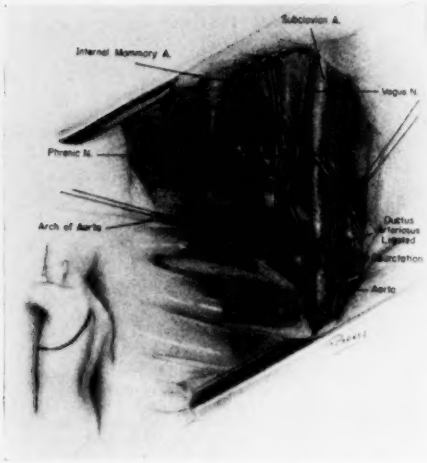

Fig. 3. Drawing of the adult type of coarctation of the aorta.

ligation, and since division unquestionably carries much greater risk, we can see no reason for continuing with complete division.

Three patients with subacute bacterial endocarditis have been cured by ligation and have not had a recurrence of their shunt.

Coarctation of the Aorta

Coarctation of the aorta is a stenosis of the first portion of the descending aorta that occurs at or about the junction of the ligamentum arteriosum with the aorta. The etiology is unknown. The condition may vary from a simple stricture, as shown in figure 3, to a long segment of narrowing, as in figure 4. Most descriptions of this anomaly[7] separate the types into the adult (fig. 3) and infantile (fig. 4). It has been noted that the infantile type is not compatible with long life, usually because of other associated anomalies. From the surgical standpoint, the two types present the same clinical picture, and the differentiation is important only in that the length of the narrowed segment determines the size of the restored aorta.

The symptoms produced by coarctation are due to the hypertension that is nearly always associated with this anomaly, and to the decreased blood flow to the lower half of the body. The hypertension is always present in the upper extremity, and the blood pressure can seldom be obtained by manometer in the lower extremity. An interesting observation by Steele[8] of the direct arterial pressures showed that the femoral diastolic was equal to the brachial diastolic. In figure 5 is shown an intra-arterial recording of the blood pressure in a patient with coarctation of the aorta. As a result of the hypertension above the stricture, headaches, palpitation, and nose bleed may occur on exertion. These symptoms may progress and other manifestations similar to those of essential hypertension may ensue. The decreased blood supply to the lower extremity may cause easy fatigability, or, in extreme

7. Taussig, H. B.: Congenital Malformations of the Heart. New York, The Commonwealth Fund, 1947.
8. Steele, J. M., and Cohn, A. E.: The Nature of Hypertension in Coarctation of the Aorta. Proc. Am. Soc. for Clinical Investigation. J. Clin. Invest. 17:514 (July) 1938.

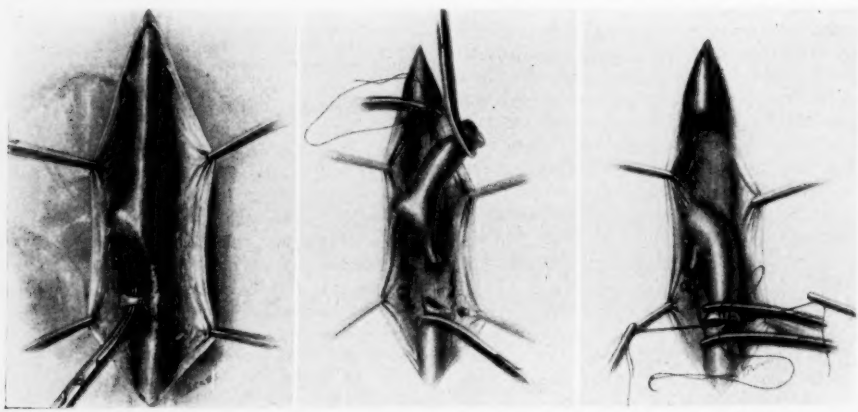

Fig. 4. Drawing of the infantile type of coarctation. The lower drawings show the use of the left subclavian artery to re-establish aortic continuity in this anomaly.

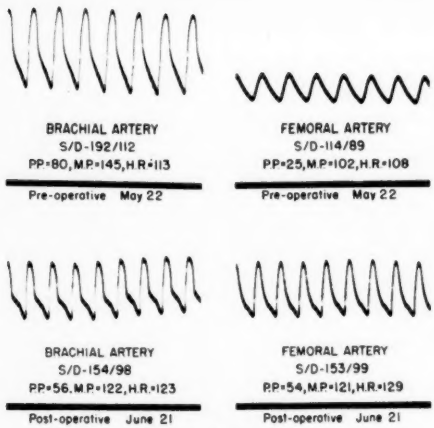

Fig. 5. Intra-arterial blood pressure recordings in a patient with coarctation of the aorta. The upper two graphs show the preoperative tracing, while the lower two show a tracing ten days after operation (courtesy Dr. Jack Myers, Department of Medicine, Duke Hospital).

S = systolic; D = diastolic; PP = pulse pressure; M.P. = mean pressure; HR = heart rate.

cases, intermittent claudication.

Diagnosis

The diagnosis of coarctation of the aorta is simple. Any young person with hypertension should be suspected of having this condition. There is usually an increase in blood pressure in the upper extremities, while the pressure in the lower extremities is always absent or decreased. Arterial pulsations are usually absent below the abdominal aorta. There is a systolic murmur over the base of the heart, usually heard best, or as well, in the interscapular region. Evidence of an extreme degree of collateral circulation may be observed in the axilla and about the tip of the scapula, and accentuated by having the patient flex the trunk. X-rays may show notching of the ribs, and absence or diminution of the aortic knob.

Indications for operation

Surgical intervention for coarctation of the aorta is indicated in any patient under the age of 20 years who has hypertension. The operation, unless symptoms warrant, should not be done in children under 7 years of age, because of the small size of the vessels. In patients over 20, there tend to occur changes in the vessel walls that make surgery more hazardous. As experience increases, patients in the older age group who have severe symptoms are undergoing successful resection of the strictured aorta. Coarctation of the aorta is always a potential hazard. Abbott[9] and Reifenstein and his collaborators[10] have shown that the life expectancy is only 35 years, and that about 75 per cent of the patients die from some cause either precipitated or aggravated by the anomaly.

Technique of operation

The operation was first performed by Crafoord[2], and then a little later by Gross[11]. It consists in excision of the aortic stricture and end-to-end anastomosis of the two ends of the aorta, after exposure through a left posterolateral incision in the bed of the fourth rib. In the long strictures it is frequently necessary to use the left subclavian artery for re-establishment of the aortic lumen, as shown in figure 4. The procedure is a formidable one, and carries a 10 per cent mortality.

Results

The details of this series will be published elsewhere. In the 6 cases operated on in this clinic there were no serious postoperative complications, and there have been no deaths. The systolic blood pressure has been reduced in all, but in the 4 cases where a full lumen has not been established the systolic pressure in the arm has not returned to normal. In all, the diastolic pressure in both the arm and leg has reverted to normal.

Symptomatically, all patients have been greatly improved after operation. Of unusual interest is a patient who had been in the hospital on two occasions in severe cardiac failure associated with aortic insufficiency from a bicuspid valve and coarctation of the aorta. There was only a moderate postoperative decrease in the systolic blood pressure, but the diastolic pressure returned to normal. His condition is greatly improved; the heart has markedly decreased in size, and he is doing light work.

Pulmonic Stenosis

Blalock and Taussig[3], in 1945, reported the first successful operation for pulmonic stenosis, consisting in the construction of an

9. Hamilton, W. F. and Abbott, M. E.: Coarctation of the Aorta of the Adult Type. II Statistical Study and Historical Retrospect of 200 Recorded Cases, Report of Three Cases, Am. Heart J. 3:381-421 (April) 1928.
10. Reifenstein, G. H., Levine, S. A., and Gross, R. E.: Coarctation of the Aorta, Am. Heart J. 33:146-168 (Feb.) 1947.
11. Gross, R. E.: Surgical Correction for Coarctation of the Aorta, Surgery 18:673-678 (Dec.) 1945.

artificial patent ductus arteriosus. The congenital anomaly with which pulmonic stenosis is most often associated is the tetralogy of Fallot (fig. 6). In anomalies of this type there are, in addition to the right ventricular hypertrophy, a ventricular septal defect, stenosis of the pulmonary artery in the region of the conus, and a dexter position of the aorta, which means that the aorta is in communication with the right and left ventricles. All of the latter defects tend to mix arterial with venous blood, and this condition, combined with the decrease in blood flow to the lungs, leads to severe cyanosis. It is interesting that the cyanosis may not appear in the first few months of life because of the persistence of a patent ductus arteriosus. With the poor oxygenation, there is a compensatory elevation in the red cell count and hemoglobin, and subsequent danger of thrombotic phenomena. The patients usually show retarded development, easy fatigability, and the typical squat after exertion characteristic of cyanotic heart disease. Clubbing of fingers and toes is nearly always present.

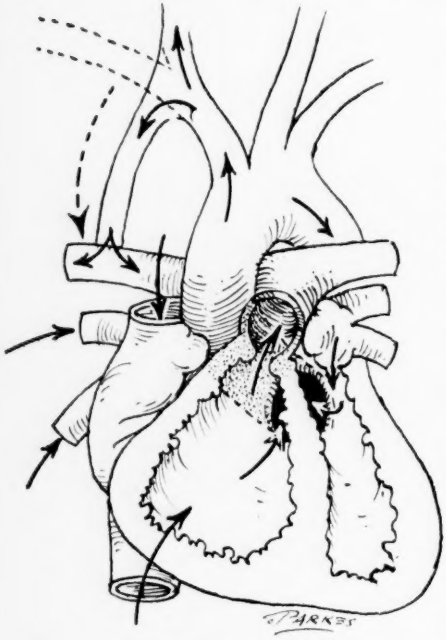

Fig. 6. A diagrammatic drawing of the heart in the tetralogy of Fallot that shows the four anomalies. Anastomosis of the right subclavian artery to the right pulmonary artery, resulting in an artificial patent ductus arteriosus, is shown.

Diagnosis

The diagnosis is dependent upon cyanosis, an elevated red cell count and hemoglobin, absence or diminution of the pulmonary artery on anteroposterior and oblique films of the chest, right ventricular enlargement demonstrable by x-ray, and right axis deviation on the electrocardiogram. The murmurs in this anomaly are not significant. There are certain points of importance in the differentiation of surgical and nonsurgical types. If fluoroscopy shows active pulsations in the pulmonary vessels or pulmonary congestion, the patient has either a patent ductus or some other type of cyanotic heart disease. It is of practical surgical importance to determine the position of the aorta, as it may descend either on the right or on the left. The position of this vessel determines the side upon which the anastomosis is to be done.

Indications for operation

Surgical intervention in the tetralogy of Fallot is indicated in any patient who has marked restriction of activity because of the decreased blood flow to the lungs. The optimum age for the procedure is from 4 to 6 years and above. Before this time, the vessels are too small for a satisfactory anastomosis. As the operation does not correct any of the malformations of the heart, but adds another, it should not be performed in patients able to do moderate activity. One should expect a reduction in the polycythemia, thus removing the threat of thrombotic phenomena; but this does not free the patient of the hazard of subacute bacterial endocarditis. It should be remembered that the procedure increases the load on the left ventricle. For obvious reasons, pure pulmonic stenosis is not an indication for the operation.

Technique of operation

In this clinic cyclopropane and oxygen are used as the anesthetic agent for this operation. Correct administration of the anesthetic is mandatory, though patients with cyanotic heart disease tolerate an expertly administered anesthesia surprisingly well. If, during the operation, technical difficulties or the anatomic arrangement makes establishment of the shunt impossible, the mortality from the operation—and particularly

from the anesthesia—is very high, approaching 50 per cent.

The technique of the operation is subject to many variations, dependent upon the arrangement of the great vessels. The best procedure is to anastomose the subclavian artery to the pulmonary artery. The approach is through the anterior chest on the side opposite the descending aorta. The anastomosis is performed in one layer with three everting continuous sutures, uniting the end of the subclavian to the side of the pulmonary artery. On occasions the shortness of the subclavian makes it necessary to use the innominate artery, but this procedure is to be avoided if possible, because of the high incidence of cerebral complications. The small size of the pulmonary artery may make it necessary to divide this vessel and anastomose its end to the end of the subclavian artery.

Potts[12] has devised a different procedure for the creation of a patent ductus arteriosus, whereby the side of the aorta is sutured to the side of the pulmonary artery. The hazard of completely clamping the aorta is avoided by an ingenious clamp that only partially occludes the lumen. The technique of Potts is particularly suited for children under 2 years of age; and it has been suggested that the chest approach always be done on the aortic side, so that the Potts operation can be done if the anatomic arrangement makes it impossible to use the subclavian artery.

Results

Three patients have been operated upon in this clinic for pulmonic stenosis. An exploratory operation was performed in one case, but the patient could not tolerate an open chest, and the procedure could not be completed. This patient survived the operation. In the second case the pulmonary artery was too small to permit a satisfactory anastomosis, and the patient died immediately after operation. The third patient had only moderately severe disability, but postoperatively there has been striking improvement. The red cell count has fallen to normal, and three months after operation the patient is normally active. There has been a slight increase in the size of the left ventricle.

12. Potts, W. J., Smith, S., Gibson, S.: Anastomosis of the Aorta to the Pulmonary Artery, J.A.M.A. 132:627-632 (Nov. 16) 1946.

Summary and Conclusions

Three types of congenital anomalies of the heart are amenable to surgical treatment. In patent ductus arteriosus and coarctation of the aorta, the abnormality of the circulatory system can be reverted to normal by surgery. In pulmonic stenosis the blood supply to the lungs can be increased only by adding another abnormality. Surgery in the latter condition, in spite of the added abnormality, produces striking improvement, with increase in the patient's activity and decrease in the polycythemia.

There have been no deaths or serious complications in 15 operations for patent ductus arteriosus, or in 6 operations for coarctation of the aorta. In 3 cases of the tetralogy of Fallot for which surgery was performed, there was one postoperative death and one unsuccessful exploration.

MYCOTIC INFECTIONS IN NORTH CAROLINA

DAVID T. SMITH, M.D.

DURHAM

With the exception of South American blastomycosis, which has not yet appeared in the United States, two or more examples of each of the various types of fungus infections have been encountered in the Duke Clinic among patients residing in North Carolina. The fungi themselves appear to be indigenous to the state, with the single exception of *Coccidioides immitis*, which must either be imported from the arid regions of the Southwest or disseminated from laboratory cultures[1].

The dermatophytes, which infect the skin, hair and nails but do not invade the deeper structures, are well known to every practicing physician and will not be discussed in this review.

Among the rarer, localized types of fungus infections we have seen two examples of rhinosporidiosis of the conjunctivae of the eye[2], 2 cases of maduromycosis of the foot, and one instance of chromoblastomycosis of

From the Departments of Medicine and Bacteriology, Duke University School of Medicine, Durham, North Carolina.

1. Smith, D. T. and Harrell, E. R., Jr.: Fatal Coccidioidomycosis: A Case of a Laboratory Infection, Am. Rev. Tuberc. 58:368-374 (April) 1948.
2. Arnold, R. and Whildin, J. G.: Rhinosporidiosis of Conjunctiva: Case Report, Am. J. Ophth. 25:1227-1230 (Oct.) 1942.

the hand[3] and one of the leg.

The other mycoses are encountered with greater frequency, and their diagnosis and treatment will be discussed in more detail.

Actinomycosis

Actinomycosis is probably the most common type of severe mycotic infection encountered in this state and in the nation. The source of the infection is not the cow, as was formerly taught, and the disease is not acquired by chewing a straw or a stick. Recent studies have shown that man himself harbors the causative organism, *Actinomyces bovis*, in the gums, about carious teeth, and in the tonsillar crypts.

Cervicofacial actinomycosis

The characteristic picture of "lumpy jaw" in man develops when the organism invades the deeper tissues of the face and neck. In many instances the infection follows the extraction of an infected tooth, but it may develop independently of any local trauma to the mouth.

Pulmonary actinomycosis

If the organisms are aspirated from the mouth into the lungs, a non-specific type of pneumonitis results. The lesions may be unilateral or bilateral, and may be located in any part of the lung, but they have a slight predilection for the bases. The shadows of the lesions on chest films are usually smooth and dense, with hazy, irregular outlines. Cavity formation is not characteristic of the lesion, and when cavities are present they are usually small, with indistinct, hazy outlines. The symptoms are usually mild in the early stages of the disease, and the nature of the infection is seldom suspected until the patient develops multiple draining sinuses in the chest wall.

Abdominal actinomycosis

When the organism, *Actinomycosis bovis*, is swallowed and passes through the intestinal canal, infection occurs most frequently in the cecum and appendix, although any part of the intestinal tract can be invaded. The patient may present the clinical picture of a subacute appendicitis or a carcinoma of the cecum. If an operation is performed, not infrequently the wound fails to heal and the patient is left with draining sinuses. In abdominal actinomycosis with or without operative interference, the infection gradually spreads to the liver and spleen, and finally by metastasis to the other organs, including the brain. In some instances the intestinal lesion is insignificant and asymptomatic, and the patient presents himself with what appears to be a primary infection of the liver or spleen.

Diagnosis

The diagnosis is suggested by the presence of hard, brawny, induration of the tissues of the face and neck, or by the presence of multiple draining sinuses in the chest or abdominal wall, but final diagnosis depends upon the demonstration of *A. bovis* in tissue biopsy, or the finding of the characteristic "sulfur granule" in the sputum or in pus from draining sinuses. The so-called sulfur granule is not really as yellow as sulfur, but is greyish in color with a faint tint of yellow. The granule is composed in part of the fungus and in part of the host's reaction to the fungus. The granule contains the thin, filamentous, branching, gram-positive organism in the central portion, and at the periphery the "clubbed ends" which are in part the host's reaction to the fungus.

Dr. Norman Conant[4] has devised a simple procedure which facilitates the finding of sulfur granules in the pus from draining sinuses. A thick pad of sterile gauze is applied to the draining area, and the pus is drained for twenty-four to forty-eight hours in the gauze. The dressing is then removed, and several layers of the gauze which lay directly in contact with the skin are transferred to a sterile Petri dish and turned so that the layers originally in contact with the lesion are directly exposed to the air. The gauze is examined with the low power of the microscope, and the granules are seen where they have been caught in the meshes of the gauze in a manner analogous to fish being caught in a fish net. The granules are transferred with a needle to a clean slide, crushed, examined unstained, and then re-examined after staining.

The methods for finding and identifying the sulfur granules have been presented in detail because the diagnosis of actinomycosis is usually established by the direct examination and not by culture. When the material can be collected from an unopened, uncontaminated lesion, *A. bovis* can be grown in

3. Martin, D. S., Baker, R. D. and Conant, N. F.: A Case of Verrucous Dermatitis Caused by Hormodendrum Pedrosoi (Chromoblastomycosis) in North Carolina, Am. J. Trop Med. 16:593-619 (Sept.) 1936.

4. Conant, N. F., Martin, D. S., Smith, D. T., Baker, R. D. and Callaway, J. L.: Manual of Clinical Mycology, Philadelphia, W. B. Saunders Co., 1944.

tubes of Brewer's thioglycollate broth or in semi-solid veal agar, but it is almost impossible to isolate the organism from sputum or from a draining sinus because of the rapid overgrowth of the colonies by secondary contaminating bacteria.

Prognosis

The mortality in untreated cases is very high, probably approaching 100 per cent, although some patients survive for several years. With iodide therapy and surgical drainage, most cases of cervicofacial actinomycosis can be cured in six to twelve months. Some patients with pulmonary actinomycosis recover with iodide therapy but most succumb to the disease, and practically all of those with cecal and abdominal infection die.

Treatment

The introduction of sulfonamides and penicillin has improved the prognosis materially[5]. Besides having a direct fungistatic and fungicidal effect on the organisms, the administration of these drugs enables the surgeon to do much more extensive resection of diseased tissues without the concomitant danger of secondary bacterial infection or of metastatic infection induced at the time of operation. Sulfadiazine or sulfamerazine is the sulfonamide of choice, and a sufficient amount should be given to maintain a blood level of 5 to 10 mg. per 100 cc. The sulfonamides should be continued as long as there is clinical evidence of infection—in some cases, six months or even longer. The optimal daily dose of penicillin is between 100,000 and 1,000,000 units, depending upon the extent of the disease and the response of the patient.

Both penicillin and sulfonamides should be used during the first two or three weeks of the disease. Occasionally the response will be so satisfactory that surgery will not be required, but in most instances surgical drainage with excision of damaged tissues is necessary. Sulfadiazine and penicillin should be used before, during, and after surgical treatment. After discharge from the hospital the penicillin may be omitted if the sulfonamides are continued.

In all cases iodides should be employed as a supplementary treatment. We use a saturated solution of potassium iodide and measure the dose in drops, which are administered in 20 to 30 cc. of water. The initial dose is 3 drops after each meal, and the dose is increased by one drop for each of the three daily doses—a total increase of 3 drops each day. If the iodides are well tolerated, the increase is continued until the patient is taking 20 to 30 drops three times a day; the dose is then reduced to 3 drops after each meal, and again increased to the maximum amount. This type of treatment should continue as long as there is clinical evidence of disease, and probably for three to six months after apparent recovery.

The patient should be re-examined every month for at least one year, because there is a tendency for the disease to recur. Patients with abdominal infections frequently have relapses, and a prolonged period of treatment, including a series of operations, may be necessary to effect a cure.

Nocardiosis

Certain species of Nocardia, particularly *Nocardia asteroides*, produce a clinical picture which is indistinguishable from that caused by *A. bovis*. The Nocardia organisms occur in nature and are not carried by man. They most often infect the feet and lungs—the cervicofacial region and abdomen less frequently. Certainly less than 10 per cent of the clinical cases of actinomycosis are caused by the Nocardia.

Nocardia asteroides is a gram-positive, branching organism which is partially acid-fast and may be mistaken for *Mycobacterium tuberculosis* if the presence of branching forms is not observed. It appears in biopsy and necropsy specimens as tangled masses of branching filaments, and only in rare instances produces true sulfur granules.

The prognosis is very poor without treatment, but many patients recover with sulfonamide and iodide therapy[5]. There is some indication that sulfadiazine is more effective than penicillin[6].

North American Blastomycosis

Blastomycosis is found throughout the United States and Canada, but there are two endemic areas where it occurs with greater frequency. One area covers the entire Mississippi Valley, and the other the Southeastern states. In the past eighteen years we have seen 50 cases of blastomycosis in patients

5. Benbow, E. P., Jr., Smith, D. T. and Grimson, K. S.: Sulfonamide Therapy in Actinomycosis, Am. Rev. Tuberc. 49:395-407 (May) 1944.

6. Jacobson, J. R. and Cloward, R. B.: Actinomycosis of the Central Nervous System, J.A.M.A. 137:769-771 (June 26) 1948.

from North Carolina and the surrounding states. The cases have been evenly divided between those with lesions limited to the skin and those with a primary lesion in the lungs or with a generalized involvement of various organs when first seen.

Cutaneous blastomycosis

Local infection begins usually as a small pimple located on the exposed surface of the body—the face, hands, arms, or legs. The lesions spread slowly, cause few symptoms, and may persist for eight to ten years before spreading to the internal organs.

Pulmonary and systemic blastomycosis

In many cases there is a primary infection of the lungs. The onset is insidious with few symptoms, and the roentgenogram usually shows dense, smooth masses without cavitation or with small, irregular, poorly defined cavities. The lesions often have sharp, irregular edges, and are frequently diagnosed as a primary carcinoma of the lung. We know of 4 cases in which a pneumonectomy was performed before the correct diagnosis of blastomycosis was established. The pulmonary infection may extend through the chest wall and produce multiple draining sinuses, although this complication is seen somewhat less frequently than with actinomycosis.

In some patients the disease is systemic in type, involving the lungs, liver, spleen, heart, prostate, bones, and brain.

Diagnosis

The diagnosis is established by finding the double-contoured, budding, yeast-like cells in scrapings from the edge of the spreading skin lesion or in sputum, pus, or other discharges. *Blastomyces dermatitidis* grows readily in seven to fourteen days when planted on blood agar and incubated at 37 C. The colony is grayish, rather small in size, yellow, and waxy; and a fresh unstained preparation shows the typical budding, yeast-like forms found in the tissues. When grown on Sabouraud's medium at room temperature, the organism is not yeast-like but appears as a white, cotton-like mold growth. Fortunately for the amateur mycologist, if the mold-like growth is subcultured on blood agar the organism reverts immediately to the yeast-like stage.

Prognosis

The prognosis is good in cutaneous blastomycosis, if properly treated, but grave in pulmonary and systemic cases even with the best treatment.

Treatment

Before treatment can be applied effectively, the immunologic status of the patient must be determined. The presence or absence of immune bodies in the blood is determined by the complement fixation test, using an extract of the fungus for the antigen. The presence or absence of hypersensitivity is established by the intracutaneous injection of a 0.1 cc. dose of a standard heat-killed vaccine, or of blastomycin in a 1:1000 dilution. The patient falls into one of the following four groups: (1) skin test positive, complement fixation negative; (2) skin test positive, complement fixation positive; (3) skin test negative, complement fixation positive; (4) skin test negative, complement fixation negative.

Dr. Donald S. Martin reported in 1941[7] that the prognosis was best in group 1 and worst in group 3, and subsequent studies have confirmed his original observations. The patients in group 4 have a recently acquired infection, and will eventually fall into one of the other three groups.

The patients in groups 1 and 2, where the skin test is positive, should be desensitized with a Blastomyces vaccine before receiving roentgen or iodide therapy. The vaccine is administered in a dilution of 1:10, 1:100, or 1:1000, depending upon the size of the skin reaction. The initial dose is 0.1 cc. of the chosen dilution, and the dose is increased every other day by increments of 0.1 cc. until the patient has reached the maximum dose of 1 cc. of the 1:10 dilution.

Patients in group 4, who show neither hypersensitivity nor immune bodies, should be actively immunized before iodides are administered. The undiluted vaccine is used in doses of 0.2, 0.4, 0.8 and 1 cc., and given at intervals of forty-eight hours. One week after the last dose the blood is tested for the presence of complement fixing antibodies. If antibodies are present, iodides are administered by the method described for the treatment of actinomycosis, but if they are absent the series of immunizing doses is continued until antibodies can be detected.

Roentgen therapy is a desirable supplementary treatment, but is most effective after desensitization and while iodides are

7. Martin, D. S.: The Practical Application of Some Immunologic Principles to the Diagnosis and Treatment of Certain Fungus Infections, J. Invest. Dermat. 4:471-481 (Dec.) 1941.

being administered.

Histoplasmosis

Histoplasmosis occurs throughout the United States and in scattered areas over the world, but seems to reach the greatest concentration in the central and lower Mississippi Valley and in the valley of the Ohio River. The endemic area extends over the mountains and into western North Carolina. We have seen one case at necropsy, and one case has been reported from the Bowman Gray School of Medicine in Winston-Salem[8].

Primary histoplasmosis

The usual form of the disease is a benign, asymptomatic pulmonary infection which leaves as a residue multiple small, calcified spots in the parenchyma of the lungs and in the hilar lymph nodes. Patients with this form of the disease almost invariably have a markedly positive skin test to 0.1 cc. of a 1:1000 dilution of a standard histoplasmin. Healed lesions of this type are frequently seen in our medical students and in patients from Tennessee, Ohio, and Missouri.

Progressive histoplasmosis

The progressive form of the disease fortunately is relatively rare, and probably occurs only in those individuals who lack sufficient resistance to localize and eliminate the primary infection. These cases occur at all ages, even in children from 1 to 3 months of age. The primary infection may begin in the ears, nose, pharynx, tongue, lungs, intestinal tract, or skin. There is usually glandular enlargement, and splenomegaly, hepatomegaly, anemia, and neutropenia are often observed. The disease regularly runs its course in three to nine months, but some patients survive for several years.

Diagnosis

The diagnosis is made by demonstrating the presence of the small, budding, yeast-like organisms in biopsy material or in smears of sputum, pus, or blood. Unlike most other fungi, these organisms live intracellularly and are found most often in mononuclear and endothelial cells. The yeast-like form can be grown with some difficulty on blood agar at 37 C. The white, cottony, mold-like form grows readily on Sabouraud's medium at room temperature, but may require twenty to thirty days for full development.

The presence of a positive skin test to 0.1 cc. of a 1:1000 dilution of a standard histoplasmin should be interpreted as indicative of a present or past infection with the organism, in exactly the same manner as one interprets the presence of a positive tuberculin test. A negative skin test does not rule out the disease, however. A patient may have a primary infection progressing to generalized disease and death, without the development of a positive skin test. Others have a positive skin test early and become anergic as the disease progresses.

Recent studies on a small series of cases[9] indicate that the presence of a positive complement fixation test, with histoplasmin used as the antigen, establishes the diagnosis of an active infection.

Prognosis

Obviously the asymptomatic cases have an excellent prognosis, but a large percentage of those who develop clinical symptoms and physical signs succumb to the disease[10].

Treatment

There is no specific treatment for histoplasmosis. Neostam has been used with varying results[11]. Possibly patients having a positive skin test and a positive complement fixation test would be improved by desensitization with histoplasmin, followed by iodide therapy.

Coccidioidomycosis

Coccidioidomycosis is limited to the dry, sandy areas of the Southwest and to a small area in Argentina. This disease resembles histoplasmosis in having a benign primary, asymptomatic form which is very common in the endemic areas. The patients are left with a positive skin test to coccidioidin, and occasionally with a small number of calcified spots in the lungs and hilar nodes.

Primary coccidioidomycosis

Apparently, a primary infection with *Coccidioides immitis* produces symptoms in a higher percentage of cases than does infection with *Histoplasma capsulatum*. The acute form of the disease lasts for a few weeks and simulates various types of respiratory infections, such as bronchopneumonia, influ-

8. Thomas, W. C. and Morehead, R. P.: Histoplasmosis: Report of a Case in North Carolina, North Carolina M. J. 4:378-382 (Sept.) 1943.

9. Bunnell, I. L. and Furcolow, M. L.: A Report on Ten Proven Cases of Histoplasmosis, Pub. Health Rep. 63:299-316 (March 5) 1948.

10. Johnson, H. E. and Batson, R.: Benign Pulmonary Histoplasmosis, Dis. Chest 14:517-524 (July-Aug.) 1948.

11. Palmer, A. E., Amolsch, A. L. and Shaffer, L. W.: Histoplasmosis with Mucocutaneous Manifestations, Arch. Dermat. & Syph. 45:912-916 (May) 1942.

enza, tuberculosis, and viral infections. In most instances, recovery is complete, with no residue left except the presence of a positive coccidioidin skin test. In some instances, however, one or more thin walled cavities are left in the lungs and the patient continues to cough up clear mucoid sputum that frequently contains blood, although the general health of the patient is not affected.

Progressive coccidioidomycosis

In approximately 0.5 per cent of the patients of European descent and in 5 to 10 per cent of Negroes, Mexicans, and Filipinos the primary disease progresses to the generalized form, with infection in the lungs, liver, spleen, glands, bones, and brain. In the progressive cases the skin test either fails to become positive or soon becomes negative as the disease progresses[12].

Both forms of the clinical disease may be seen in North Carolinians who have visited the endemic area in the Southwest.

Diagnosis

The diagnosis is established by finding the characteristic spherules in the sputum, pus, or other materials. The spherule is a thick walled structure, 20 to 80 microns in diameter, which contains 10 to 100 endospores. The spherules usually are found in the sputum or pus from draining lesions of the progressive case, but frequently cannot be seen in the sputum of patients with the primary form of the disease, or with residual cavities from primary coccidioidomycosis, although their presence can be demonstrated by culture.

The spherules are not reproduced in culture. The organism grows on Sabouraud's medium at room temperature, producing a white, cottony, mold-like growth which develops a slight tan color after three or four weeks. Typical small, rectangular or oval arthrospores measuring 2.5-3 by 3-4 microns are produced by fragmentation of the hyphae. These arthrospores are the natural infective form of the organism, and cultures must be handled with great care in the laboratory to prevent infection of the laboratory personnel[1].

Prognosis

The prognosis of the primary infection is good in the Mexican, Negro and Filipino, and excellent in the Caucasian. The prognosis is exceedingly grave in all races when the progressive form of the disease develops. A few patients have recovered with supportive treatment. Patients who have persistently positive skin tests and positive complement fixation tests with a coccidioidin antigen may be desensitized with coccidioidin and treated cautiously with iodides.

Cryptococcosis

Cryptococcosis, formerly called torulosis, is an endogenous infection presumably carried by man. This mycosis occurs in all parts of the world. We have seen one primary infection of the skin and bones, two primary infections of the lungs, and three acute and one chronic infection of the brain and meninges. The patient with the chronic infection had symptoms for more than four years.

The primary infection is usually acquired through the lungs or skin. Often the primary lesion is insignificant, and the patient presents the symptoms of a meningitis which resembles quite closely a subacute type of tuberculous meningitis.

Diagnosis

The diagnosis is established by finding in the sputum, pus, or spinal fluid a budding, yeast-like organism which is surrounded by a large gelatinous capsule. Fresh preparations made in a drop of India ink offer the best method for demonstrating the presence of the capsule. The organism grows readily after seven to fourteen days on Sabouraud's medium or on blood agar at room or incubator temperature. The colonies are medium in size, soft in consistency, and have a shiny appearance and a faint cream-like color. The cultured organism usually shows a capsule, but this structure is much smaller than the one observed in the original material examined directly from the patient.

In the acute, progressive cases, there is a complete lack of immunologic response on the part of the patient. The skin test, agglutination test, and complement fixation test are all negative. In the more chronic cases, particularly those with destructive lesions of the bones, the skin test with a heat killed vaccine may be positive and specific agglutinins may be present in the patient's serum.

Prognosis

Before the introduction of sulfonamide therapy the disease was usually fatal.

12. Smith, C. E., and others: The Use of Coccidioidin. Am. Rev. Tubere. 57:330-360 (April) 1948.

Treatment

Some patients with primary infections of the skin and lungs, and an occasional patient with meningitis recover following intensive therapy with sulfadiazine[13]. The blood level of the drug should be maintained at 10 mg. per 100 cc., and the treatment continued for one month after apparent recovery. Patients with positive skin tests should be desensitized with a heat killed vaccine or with the vaccine described by Benham[14], in which the capsule has been altered if not completely removed by treatment with normal hydrochloric acid. If the patient has a negative skin test, iodides should be administered, by the method described for actinomycosis, after the first week of treatment with sulfadiazine. The hypersensitive patient should be desensitized before iodides are prescribed.

Sporotrichosis

Sporotrichosis is caused by an exogenous fungus, *Sporotrichum schenckii*, which is world wide in its distribution. It is a saprophyte or parasite of plants, and man is an accidental host. Farmers, laborers, horticulturists, and children are not infrequently infected because of their close contact with vegetable materials.

The most common form of the disease is the ulceroglandular type of infection, which occurs usually on the hands but may appear on other exposed portions of the body. The primary lesion, or "sporotrichotic chancre," begins as a small pimple but slowly increases in size, becoming hard, dry, black in color, and finally ulcerating. As the local lesion evolves, a chain of nodules appears along the arm, and the axillary lymph nodes become enlarged. These secondary nodes may or may not become open ulcers.

Other rarer clinical forms of sporotrichosis are (1) skin lesions which simulate epithelioma[15], (2) mucosal sporotrichosis, (3) generalized sporotrichosis, (4) skeletal sporotrichosis, and (5) primary pulmonary sporotrichosis.

Diagnosis

It is obvious from the clinical description that ulceroglandular sporotrichosis resembles very closely ulceroglandular tularemia. With rare exceptions, the general constitutional symptoms are much more severe with tularemia than with sporotrichosis.

The diagnosis is established by growing the organism from an open or unopened nodule or from a gland removed for biopsy. The biopsy sections show giant cells and increased mononuclear cells, but the fungus itself is rarely seen; therefore, it is essential that cultures as well as sections be prepared from the biopsy material.

The organism grows slowly on Sabouraud's medium at room or incubator temperature, forming after seven to twenty-one days small, elevated, rough colonies with fine, hair-like processes on their under surface which project down into the medium. When material from the colony is examined under the high power of the microscope, it is seen to consist of delicate filamentous threads, which have at their ends and along their sides small pear shaped spores measuring 2-4 by 2-6 microns in size.

Prognosis

Sporotrichosis is a chronic disease, persisting for many months if not treated, but rarely causing death except in the generalized and visceral types of infection.

Treatment

This is the easiest of all the mycoses to treat. Iodides regularly produce a progressive if not a rapid recovery. The doses are somewhat larger than those commonly used for the other mycoses. The initial dose is 5 drops of a saturated solution of potassium iodide three times a day after meals, and the amount is increased by 3 drops each day, up to 30 or more drops per dose. Compresses saturated with Lugol's solution may speed the healing of the local lesion. Sodium iodide, in doses of 1 Gm. daily, may be given intravenously as a supplement or substitute for the iodides by mouth.

If healing is not progressive, the patient should be tested for excess sensitivity with a heat killed vaccine made from the patient's culture or from a stock culture.

The iodide should be continued for one month after apparent recovery, to prevent relapse.

Moniliasis

Moniliasis is an endogenous infection carried by man and is found in all parts of the world. The organism infects the skin, nails, tongue, pharynx, bronchi, lungs, vagina, and

13. Marshall, M. and Teed, R. W.: Torula Histolytica Meningoencephalitis: Recovery Following Bilateral Mastoidectomy and Sulfonamide Therapy, J.A.M.A. 120:527-529 (Oct. 17) 1942.
14. Benham, R. W.: Cryptococci: Their Identification by Morphology and by Serology, J. Infect. Dis. 57:255-274 (Nov.-Dec.) 1935.
15. Smith, L. M.: Sporotrichosis: Report of Four Clinically Atypical Cases, South. M. J. 38:505-509 (Aug.) 1945.

in rare instances the bones and brain. Among the several species of *Monilia*, or *Candida* as the genera is now called, *Candida albicans* is the only one with a primary pathogenicity, and even this species is not nearly as pathogenic as the other fungi discussed above. *Candida albicans* is frequently a secondary invader on hands which have been macerated by water, in the mouths of infants whose mucosa has been traumatized by washing, or in the vagina of patients who have diabetes or are pregnant.

Bronchial moniliasis

The most frequent type of clinical infection is a subacute or chronic type of bronchitis, where the sputum is white, mucoid and gelatinous, and not definitely purulent. Medium and coarse rales are usually present, and hemoptysis infrequently occurs.

Pulmonary moniliasis

Less frequently a more severe type of lobular or lobar pneumonia results from an infection with this organism. The disease is occasionally fatal, but recovery is the rule rather than the exception.

Diagnosis

The diagnosis of primary bronchial and pulmonary moniliasis is difficult to establish, because of the frequency with which the organism occurs as a secondary invader in cases of purulent bronchitis, bronchiectasis, pulmonary abscess, tuberculosis, pulmonary neoplasms, and even in primary blastomycosis and cryptococcosis of the lungs. Approximately 30 per cent of the adult population have positive skin tests, and 20 to 30 per cent have agglutinins for Monilia in their serum, in the absence of clinical evidence of infection. The individual patient may have a positive skin test and no agglutinins, or may have agglutinins and a negative skin test.

Approximately 50 per cent of patients with bronchial asthma of the intrinsic type have Monilia along with various types of bacteria in their sputum. Here the Monilia are obviously secondary invaders, but they are good antigens, contribute to the patient's sensitivity, and should be included in the desensitizing mixture. Many of these asthmatics will give a delayed tuberculin-like reaction to a Monilia vaccine, but some also give the immediate wheal reaction.

Because Monilia are found so frequently as secondary invaders, it is a natural temptation to ignore them completely and thereby miss the authentic cases of primary moniliasis which should be recognized and treated. It has been our policy to eliminate, so far as possible, the presence of tuberculosis, neoplasm, abscess, bronchiectasis and more serious pulmonary mycoses, and then proceed to treat the patient for moniliasis. If the symptoms, physical signs, and roentgen shadows disappear under treatment, we conclude that the diagnosis of moniliasis is correct.

Candida albicans can be found as a budding, yeast-like organism in fresh preparations of sputum, skin, and oral and vaginal secretions. The organisms grow readily on Sabouraud's medium at room and incubator temperatures, forming soft white colonies which resemble colonies of *Staphylococcus albus* but have a definite yeast-like odor. *Candida albicans* is differentiated from the nonpathogenic candida or monilia by the presence of characteristic chlamydospores on corn meal agar and by its pathogenicity for the rabbit.

Prognosis

Moniliasis is a chronic type of mycosis, but rarely causes death.

Treatment

Patients with bronchial moniliasis who have negative skin tests are treated immediately with potassium iodide, but those with positive skin tests should be desensitized before iodides are administered.

Most cases of pulmonary moniliasis respond to iodides, but very acute ones need additional treatment with gentian violet administered intravenously. One may either use a commercial preparation or prepare the dye in the hospital laboratory. Gentian violet or crystal violet should be dissolved in sufficient physiologic saline to make a 0.5 per cent solution. The solution must be filtered through a Seitz or Berkefeld filter to remove undissolved particles of the dye. The dose is 5 mg. per kilogram of body weight, and may be repeated daily for three to five days. There are no systemic reactions to the filtered solutions, but frequently the arm veins into which the dye has been injected become thrombosed. No complications have been observed from the thrombosed veins.

Geotrichosis, Aspergillosis, Mucormycosis, and Penicilliosis

These mycoses occasionally produce severe primary infections, and in rare instances cause death. They are found most commonly,

however, as saprophytic contaminants, or at best secondary invaders like the Monilia, and the approach to the diagnosis is the same as that described for moniliasis. The causative organisms grow readily on Sabouraud's medium, and are easily identified as to genera but not as to species[16].

The principles of treatment are the same as for moniliasis, with iodides being used directly if the skin test is negative but only after desensitization if the skin test is positive[17].

16. Gerstl, B., Weidman, W. H. and Newman, W. H.: Pulmonary Aspergillosis; Report of Two Cases, Ann. Int. Med. 28:662-671 (March) 1948.
17. Smith, D. T.: Fungus Diseases of the Lungs, Springfield, Illinois, Charles C. Thomas, 1947.

CHEMOTHERAPY AND THE USE OF VACCINE IN INFECTIOUS ASTHMA

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Infectious asthma is a manifestation of bacterial allergy, and the presence of infectious tissue, mainly in the respiratory tract, is an essential prerequisite for its development. This type of asthma may be the result of frequently recurring bouts of bronchitis[1]; it may be marked by foci of infection in the nose and throat, paranasal sinuses, or bronchial tree[1,2]; it may be due to sensitization to toxins formed in various sites and by a great number of different pyogenic organisms[2]. These essential facts must be kept in mind in planning the treatment of infectious asthma and in evaluating the results of chemotherapy and the administration of vaccines.

Chemotherapy

It has been pointed out by Finke[1] and others that many of the therapeutic failures in infectious asthma can be traced to an omission in treating the early bronchial and pulmonary infections. We agree that the proper handling of the early phases of bronchopulmonary infections might well prevent the later development of asthma.

Read before the Southeastern Allergy Association, January 22, 1949.

From the Department of Medicine, Duke University School of Medicine, Durham, North Carolina.

1. Finke, W.: The Significance of Chronic Bronchitis in Infectious Bronchial Asthma, Ann. Allergy 5:364-375 (July-Aug.) 1947.
2. Hansen-Pruss, O. C.: Bacterial Allergy and the Importance of Otolaryngological Procedures, Tr. Am. Assoc. Otolaryngol., Rhinol. & Ophth., 1949, in press.

The following chemotherapeutic agents are available: penicillin[3], streptomycin[3c,4], hydrogen peroxide[3a,b,5], urea hydrogen peroxide[3a,c,5b], and sulfonamides[3c,d,6]. All of these agents except hydrogen peroxide and urea hydrogen peroxide, which are used only as aerosols, can be administered by various routes in the treatment of individuals with infectious asthma.

It is essential to determine the bacterial flora present before selecting the antibiotic or chemical substance best suited for the individual patient. Cultures from the nasopharynx, sinuses, or sputum must be made, but a fair estimate of the predominating type of bacteria can be obtained by a simple gram stain of a nasal secretion or sputum smear.

Penicillin[3]

This agent is best administered by aerosol in doses varying from 10,000 to 50,000 units, three to four times a day[3c]. Our method has been to dissolve 25,000 units in 1 cc. of water nebulized with 0.5 to 1 cc. of Vaponefrin or Isuprel, and to administer this solution with an oxygen jet flow of 6 liters per minute. We believe that the addition of an antispasmodic will facilitate the delivery of penicillin to the smaller bronchioles. It is not necessary to add glycerol to strong penicillin mixtures to preserve the particle or drop size[3c].

Abramson[3c] reported the following findings:

1. Penicillin solution was not altered to any extent by the gas flow incidental to nebulization.

3. (a) Abramson, H. A.: Combined Penicillin and Hydrogen Peroxide Aerosol Therapy in Lung Infections, Ann. Allergy, 4:199-206 (May-June) 1946. (b) Abramson, H. A.: Aerosol Therapy of the Lungs and Bronchi with Special Reference to Penicillin and Hydrogen Peroxide, Bull. New England M. Center 8:97-106 (June) 1946. (c) Abramson, H. A.: Principles and Practice of Aerosol Therapy of the Lungs and Bronchi, Ann. Allergy 4:440-456 (Nov.-Dec.) 1946. (d) Barach, A. L. and Garthwaite, B.: Physiologic and Antibiotic Therapy of Intractable Bronchial Asthma, Ann. Allergy 5:297-316 (July-Aug.) 1947. (e) Hampton, S. F. and others: The Clinical Use of Penicillin in the Treatment of Intrinsic Bronchial Asthma, J.A.M.A. 127:1108-1109 (April 28) 1945. (f) Leopold, S. S. and Cooke, R. A.: Penicillin in the Treatment of Intractable Bronchial Asthma, Am. J. M. Sc. 209:784-787 (June) 1945. (g) Segal, M. S. and Ryder, C. M.: Penicillin Aerosolization in the Treatment of Various Respiratory Infections, New England J. Med. 233:747-756 (Dec. 20) 1945.
4. (a) Olsen, A. M.: Streptomycin Aerosol in the Treatment of Chronic Bronchiectasis, Proc. Staff Meet., Mayo Clin. 21: 53-54 (Feb. 6) 1946. (b) Schwabacher, H.: Effect of Sputum on Streptomycin, Nature 162:339 (Aug. 28) 1948.
5. (a) Abramson, H. A.: A Stable Hydrogen Peroxide Aerosol, Science 96:238 (Sept. 4) 1942. (b) Brown, E. A.: Studies on Tissue Tolerance to a New Glycerol Peroxide Antiseptic Solution, Ann. Allergy, 4:33-39 (Jan.-Feb.) 1946.
6. Stacey, J. W.: Inhalation of Nebulized Solutions of Sulfonamides in the Treatment of Bronchiectasis, Dis. Chest 9:302-306 (July-Aug.) 1943. (b) Taplin, G. V. and Bryan, F. A.: The Use of Micronized Therapeutic Agents by Inhalation, Ann. Allergy 6:42-48 (Jan.-Feb.) 1948.

2. The penicillin formed an aerosol that was readily removed with no sensible loss of activity.

3. Penicillin aerosols readily penetrated the lungs of animals and man.

4. Penicillin could be recovered from the lung tissues of animals treated with penicillin aerosol.

5. Penicillin aerosols diffused from the respiratory tract into the blood stream.

6. Penicillin was readily recovered from the urine.

7. As much as 250,000 units of penicillin per cubic centimeter could be nebulized and inhaled without lung injury.

This antibiotic is also available as dust[3b], and we have used this preparation recently in dosages of 100,000 to 500,000 units a day dispensed through an Abbott Aerohalor. Again, the inhalation of the penicillin dust should be preceded by the inhalation of an antispasmodic.

Penicillin is also efficacious if given intramuscularly, but the literature seems to indicate that penicillin aerosol is to be preferred in the more chronic forms of bronchial or pulmonary infections, such as are found in patients with infectious asthma. Oral penicillin has been used more sparingly, and reports of beneficial effects in the treatment of infectious asthma are relatively few.

Patients who receive penicillin aerosol or penicillin dust must be urged to wash out their mouth and throat thoroughly in order to prevent local penicillin reactions in the mouth, throat, or tongue. These local reactions are relatively rare. Increasingly frequent reports of general allergic reactions to penicillin are appearing in the literature, but almost all of these reactions have followed the oral or parenteral administration of this antibiotic. We have, as yet, not seen a systemic allergic reaction to penicillin aerosol or dust in 178 patients with infectious asthma, although local reactions can be expected in 1 to 2 per cent. The antihistaminics are quite effective in controlling the general reactions to penicillin.

Penicillin aerosol may be combined with streptomycin without decreasing the efficiency of either agent[3c]. On the other hand, the activity of penicillin will be destroyed if it is exposed to hydrogen peroxide[3c].

It is, of course, essential to check the bacterial flora from time to time when penicillin aerosol or dust is used, since there is no need to continue the use of penicillin indefinitely if the gram-positive organisms have disappeared from the nasopharynx or bronchial secretion.

Streptomycin

This agent may be used by aerosol, or by the oral or intramuscular route. It is poorly absorbed from the bronchial mucosa[4b], and this fact explains perhaps the paucity of reactions to streptomycin aerosol. Since it is more active in an acid than in an alkaline sputum, Schwabacher[4b] advises the concomitant administration of ammonium chloride in expectorant doses. Parenterally administered, streptomycin may lead to severe reactions, particularly eighth nerve deafness, and so far the intramuscular injection of streptomycin has proven rather painful. Streptomycin aerosol is indicated in patients with a predominantly gram-negative flora, whether this is a primary finding or is noted after penicillin aerosol or dust has been used and the symptoms of infectious asthma continue. An extensive literature has accumulated dealing with the efficacy of streptomycin in many pulmonary infections.

A solution of streptomycin is prepared by dissolving 0.5 Gm. (500,000 units) in 10 cc. of sterile saline or water[3c,4a]. One to 2 cc. of this solution is then given as an aerosol every two to four hours. If the total daily dose does not exceed 0.5 to 1 Gm., and if the four-hour schedule is employed, irritation of the mouth, throat, and trachea rarely occurs. As has already been mentioned, streptomycin can be combined effectively with penicillin. Glycerol is not necessary to increase the stability of streptomycin aerosol[3b]. Vaponefrin or Isuprel is helpful, and does not diminish the efficacy of streptomycin[3a-c,5].

Hydrogen peroxide and urea hydrogen peroxide

The peroxides are regarded as antiseptics capable of combatting both gram-positive and gram-negative bacteria, and urea acts as a stabilizing agent and as a bacteriocide. Hydrogen peroxide is usually stabilized with a 10 per cent solution of glycerol, and is administered as an aerosol in a 3 to 4 per cent solution. Urea hydrogen peroxide in a 9 per cent solution is combined with a 10 per cent solution of glycerol as a stabilizer (particle preserver), and this mixture contains about 3 per cent of active hydrogen peroxide. It is administered for ten minutes at a time, seven times a day. The total amount of peroxide solution given should probably not

exceed 2 to 4 cc. a day.

This agent has proven practically nonirritating to the mucosa of the upper respiratory tract, and it apparently diffuses widely throughout the bronchial tree, effectively loosening mucus plugs and killing bacteria[5b]. Hydrogen peroxide cannot be used in the same nebulizer with streptomycin or penicillin, but can be given alternately with either of these antibiotics. Abramson[3a,b,5a] and others[5b] feel that the use of hydrogen peroxide aerosol and penicillin aerosol is quite effective in the treatment of chronic pulmonary and bronchial infections.

Sulfonamides[3c,4,6]

The recent emphasis on penicillin and streptomycin has overshadowed the efficacy of the sulfonamides in the treatment of chronic bronchopulmonary infections in asthmatics. The sulfonamides can be easily nebulized in a 5 per cent solution[3c,6a], and microcrystals[7] of the various sulfonamides can be readily used. An appreciable concentration of the drug in the blood is obtained by the inhalation of a sulfonamide.

In this clinic we have not used aerosol sulfonamides, but have administered sulfamerazine (1 Gm. every four hours for twelve doses) or sulfadiazine (4 Gm. a day for three days) by the oral route in conjunction with penicillin aerosol, whenever the sputum was purulent or when patients proved resistant to penicillin aerosol. We believe that sulfonamides given by mouth increase the efficacy of penicillin aerosol by reducing the number of gram-negative organisms in the respiratory tract, and consequently the amount of penicillinase produced by these organisms. The same results may, of course, be expected with the combined administration of penicillin and streptomycin.

Vaccine Therapy[2,8]

The subject of vaccine therapy in infectious asthma is quite controversial. Thomas and Touart[8c] are enthusiastic advocates of specific bacterial desensitization, and they reported that 65 per cent of 200 patients with bacterial asthma had been completely or markedly relieved by this means. The organisms which they found to be the most common offenders were staphylococci, streptococci, pneumococci, enterococci, B. coli, B. friedländer, B. fecalis, Alkaligenes, Neisseria catarrhalis, and atypical gram-negative cocci and bacilli. On the other hand, Unger feels that vaccine therapy in chronic asthma is of no use whatsoever[9]. Obviously, it is impossible to evaluate accurately the role of vaccine therapy. There is no measuring stick which will prove infallible, and the interpretation of results will vary with the number of patients treated and followed clinically, and with the observer's ideas of what constitutes improvement[2].

In the Duke Hospital clinic we have made it a practice during the past 18 years to use autogenous vaccines for patients with infectious asthma, and also to incorporate such vaccines in the mixtures of allergens used to desensitize patients who are allergic to inhalants but who are also prone to recurrent upper respiratory infections. Our vaccine is made from aerobic and anaerobic cultures. The bacteria grown vary a great deal, but the flora is not very different from that reported by Thomas and Touart[8c]. In addition, sputum specimens and the bronchial secretions obtained by bronchoscopy are cultured on Sabouraud's medium for fungi.

We agree with Cooke[8a] that skin tests to autogenous vaccines are of little value in predicting the patient's degree of hypersensitivity to bacteria, or the eventual benefit to be expected from vaccine therapy. This statement does not apply in all instances to fungi; many patients will give a strong reaction to vaccines containing fungi, and if this is not recognized, the administration of such a vaccine in too strong a concentration will prove deleterious to the patient. The fungi which most commonly produced reactions among our patients (about 2125 tested) were monilia, oidomycin, trichophytin, and penicillium, in the order named.

It is our practice to start desensitization therapy with a vaccine containing the bacteria and fungi grown from the patient's cultures, in a 1:2,000 dilution. The necessary inhalants in a dilution of 1:20,000 may also be included in the vaccine. The dose is increased gradually until the maintenance mixture contains the undiluted bacterial vaccine,

7. Mutch, N.: Inhalation of Chemotherapeutic Substances, Lancet 2:775-780 (Dec. 16) 1944.
8. (a) Cooke, R. A.: Infective Asthma: Indication of Its Allergic Nature, Am. J. M. Sc. 183:309-317 (March) 1932. (b) Thomas, W. S.: Autogenous Vaccine Treatment of Asthma, J. Allergy, 1:86, 1929. (c) Thomas, W. S., and Touart, M. D.: Late Vaccine Skin Reaction, J. Allergy, 4: 242-254 (May) 1933.
9. (a) Unger, L., and Gordon, B. F.: Bronchial Asthma: Annual Critical Review of Recent Literature, Ann. Allergy, 6:84-93 (Jan.-Feb.); 159-210 (March-April) 1948. (b) Unger, L.: Bronchial Asthma; Annual Critical Review of Recent Literature, Ann. Allergy 4:299-334 (July-Aug.) 1946.

the fungi extract in a 1:10 dilution, and, when indicated, the other allergens (pollens and other inhalants) in a 1:25 dilution.

Very few, if any, patients with chronic infectious asthma will be benefited by autogenous vaccine therapy alone. Vaccine therapy must be considered as an adjunct to therapy, and not primarily as a specific form of treatment, as long as infection persists in the upper respiratory tract. In a recent survey of 152 patients with the mixed and infectious types of asthma, who were subjected to the necessary nose and throat surgery and then received autogenous vaccine treatments, Hansen[2] reported that 69 per cent were either completely relieved or markedly improved.

Summary and Conclusions

The treatment of infectious asthma should be based on the concept that the presence of infectious tissue is a prerequisite for the development of bacterial allergy. In the human being, bronchospasm and generalized vascular damage are the manifestations of such a reaction.

The following principles and agents are at our disposal in the treatment of infectious asthma:

1. The antispasmodics like Vaponefrin or Isuprel facilitate the action of antibacterial agents.

2. One of the antibiotics—penicillin or streptomycin—must be employed. The choice depends upon whether the predominant bacterial flora is gram-positive or gram-negative. These two agents can be used alternately or in combination, with excellent results.

3. The hydrogen peroxide compounds, including urea hydrogen peroxide, cannot be used in the same mixture with penicillin or streptomycin. Glycerol is needed to preserve their particles. They are able to diffuse widely throughout the bronchial tree, and are bactericidal to both gram-positive and gram-negative organisms.

4. The sulfonamides can be employed parenterally, by mouth, or as an aerosol, and are a very valuable therapeutic adjunct in the treatment of purulent tracheobronchitis or pneumonitis occurring in patients with infectious asthma. When used in combination with penicillin aerosol, the sulfonamides decrease the formation of penicillinase and enhance the efficacy of penicillin.

5. Vaccine therapy is still a debatable issue, because the efficacy of such therapy cannot be measured accurately. Vaccine therapy alone will prove useful only in selected instances of infectious asthma. In our experience, it has proven quite effective if used after surgical removal of chronic foci of infection, or after the control of acute infective agents by antibiotics.

6. Every patient with infectious asthma presents an individual problem. No set routine or treatment can be offered for such patients. The best results in the treatment of a patient with infectious asthma can be achieved only by a logical and intelligent application of the various measures described.

RESULTS OF SURGERY IN BRONCHIECTASIS

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When the Thoracic Surgical Division was established at Duke Hospital in January, 1947, under the leadership of Dr. Josiah C. Trent, it was felt advisable to review all of the pulmonary resections performed in this clinic prior to that time. One hundred and twenty-five such cases were analyzed. The present report concerns the patients in this group who were operated upon for bronchiectasis. Such a review is of value chiefly from the standpoint of rectification of mistakes and improvements in diagnosis, operative treatment, and postoperative care. Consequently, the present report is concerned largely with an analysis of the mortality and morbidity in this series, and with the manner in which the various complications arising in the surgical therapy of this disease have been minimized.

Analysis of Fifty-Six Pulmonary Resections

Clinical material

Between January, 1938, and December, 1946, 56 pulmonary resections for bronchiectasis were carried out at Duke Hospital. The various operative procedures were divided as follows: (1) 9 right lower lobectomies, (2) 11 middle and lower lobectomies, (3) 18 left lower lobectomies, (4) 9 lingula and left lower lobectomies, and (5) 9 right pneumonectomies. Only one patient in this series

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had a bilateral operation for bronchiectasis, though 13 had involvement on both sides. Twelve of the operations were carried out between 1938 and 1940, 5 between 1941 and 1943, and the remaining 39 from 1944 through 1946.

Among the 55 patients, there were 29 males and 26 females. There was a marked preponderance of the younger age groups, almost half the patients being under 20 years of age. Ten procedures were carried out in the first decade of life, 17 in the second and third decades, and 9 of the remaining 11 were in patients under 50. The duration of symptoms varied from less than one year to thirty years, but in half the cases it was less than two years. Of interest is the fact that hemoptysis occurred in 26 of these 55 patients.

Preoperative therapy during the early phase was directed chiefly toward control of the amount of suppuration. Operations were carried out during the summer months following long periods of enforced postural drainage. Little dependence was placed on the various sulfonamide drugs. These were used chiefly in the postoperative period in an effort to control the ever-present danger of empyema and bronchopleural fistula. After the use of penicillin was begun in 1944, operations were no longer postponed, and emphasis was shifted to chemotherapy for the control of suppuration. During the last three years, penicillin was used parenterally, intrabronchially, and intrapleurally. All operative procedures were carried out under endotracheal positive pressure anesthesia, and tracheobronchial aspiration by catheter was employed to maintain a clear airway.

Immediate results

Pulmonary resection was successfully carried out in 49 of the 55 patients. There were 3 early and 3 late postoperative deaths; these will be discussed in some detail later. The incidence of postoperative complications was quite high, especially in the first part of the series. Bronchopleural fistula occurred in 7 cases and empyema in 8; there were, however, no fatalities in this group and surgical correction of these complications was eventually successful in all. Postoperative spread of the disease with resultant bronchopneumonia was diagnosed in 8 patients, and accounted for 2 deaths. Postoperative atelectasis occurred in 7 patients, but caused no fatalities.

Follow-up studies

Of the 49 successfully treated cases, follow-up studies have been completed in 44. Seven patient have been followed from five to ten years. Eight patients have been followed for three to four years, 11 for two years, 2 for eighteen months, 12 for one year, and 2 for six months.

Three patients have died since discharge from the hospital. One patient had bilateral disease and expired elsewhere during the second pulmonary resection. The second patient was readmitted nine months following pulmonary resection, and expired with a fulminating septicemia due to endocarditis. In the third case a large area of tuberculous infiltration developed in the right lung four months following a left lower lobectomy for proven nontuberculous bronchiectasis; the patient died six months later despite adequate sanatorium care.

Of the 41 living patients who have been followed, satisfactory results have been obtained in 40; all of these are leading normal lives and are engaged in active routine occupations. Ten patients are completely asymptomatic. Nineteen patients have very slight cough and minimal sputum, but consider themselves cured of their original disease. Three of these originally had bilateral disease; the worse side was resected, and they are no longer bothered by the residual disease in the opposite lung. Five patients, on 2 of whom a pneumonectomy was performed, complain only of moderate dyspnea; all are employed in sedentary occupations and are living otherwise normal lives. No patient in this series, which includes one bilateral resection and one pneumonectomy in a 2 year old child, complains of dyspnea which is incapacitating or prevents him from carrying on his normal occupation.

Of 5 patients with bilateral disease, 3 have slight residual symptoms, while 2 others have a moderately productive cough and occasional slight hemoptysis; with the use of postural drainage these 2 have very little disability, and they feel that they have been markedly improved by their operation. One patient continues to have productive cough with occasional blood streaking, but is doing a normal amount of work; there is no apparent cause for his continued symptoms.

One patient with far advanced bilateral disease, in whom the operation on both sides could not be completed, is classified as un-

improved. He has been readmitted on numerous occasions with recurrent bronchopneumonia, and his disability is so great that he is unable to work.

Comment

The analysis of these 56 resections, covering the period from 1938 through 1946, has led to many interesting observations which may be correlated with the progress made by thoracic surgery during this time.

Deaths

Of the 6 hospital deaths in this series, it is felt that 4 might well have been prevented if the resections had been done under present day conditions. The other two represent difficulties inherent in pulmonary surgery which account for unavoidable deaths in any large series. In one case in which the right middle and lower lobes were being resected, the vein to the upper lobe was divided inadvertently, because of anomalous origin of the superior vein. The accident was not recognized at the operating table, and the patient died eighteen hours later. The other case concerned a patient with massive hilar inflammatory changes, so severe as to necessitate a mass ligation of the artery, bronchus, and inflammatory tissue. She died one hour postoperatively of sudden irreversible shock; although autopsy was denied, it was concluded that massive hemorrhage from the hilar stump was probably the direct cause of death.

Of the 4 deaths which are now thought preventable, one occurred in a 10 year old girl in whom a pneumonectomy was performed. The operative procedure was difficult because of inflammatory changes about the hilum, and there was considerable loss of blood. Although the child weighed only 25 Kg., she received 1300 cc. of blood and 1000 cc. of plasma and glucose during the four hour procedure. Despite this she was in and out of shock throughout the operation. Death occurred four hours later, and autopsy revealed marked pulmonary edema.

Every thoracic surgeon fully realizes the benefit of blood replacement during thoracic operations, and it is also generally known that shock during a pulmonary resection may be due to a number of causes other than direct blood loss. During the period of time covered by this series of cases, blood replacement during the procedure was based upon the operator's estimate of blood loss. The danger of such discrepancies as that noted above, however, is always present, and most surgical centers now employ some method of determining the actual blood loss during the procedure. The simplest method, and probably the one most commonly used, is that of weighing all discarded sponges; blood replacement can then be controlled fairly accurately, and such deaths as occurred in this case can be prevented.

An example of the mistakes that may occur in the clinical evaluation of pulmonary function is apparent in another death in this group.

A 34 year old white man had had a seven-rib thoracoplasty on the right for pulmonary tuberculosis four years prior to admission here. The tuberculosis had been proven to be under control, although there was considerable scarring in the opposite apex. Bronchiectasis had developed under the thoracoplasty, and the patient was considered a good candidate for pneumonectomy. In the preoperative studies, one measurement of vital capacity was done, which showed a volume of 2400 cc. of air; the expiration time was not calculated. It was felt that he would have adequate pulmonary function postoperatively, although it was realized that there was considerable normally functioning lung beneath the thoracoplasty which would be resected.

Pneumonectomy was carried out, and there were no operative complications. On the fourth postoperative day he began having progressive respiratory embarrassment, despite the fact that a roentgenogram showed the left lung to be clear. He expired in cardiac failure on the eleventh postoperative day. Autopsy revealed marked fibrosis in the left upper lobe and right sided cardiac failure.

Death in this case was due directly to lowered pulmonary reserve, plus pulmonary hypertension due to fibrosis. If preoperative function studies had been available then, they would probably have given results contraindicating resection.

Exceptional progress has been made during the past few years in the study of the pulmonary reserve. It is no longer necessary to rely simply on one's clinical judgment in deciding whether or not a patient can stand a resection from the standpoint of loss of functioning lung tissue. Many tests and instruments have been devised which will determine the oxygen uptake by each lung, the efficiency of each lung in terms of supplying oxygen to the blood and removing carbon dioxide, and the drop in pulmonary function which may be expected to result from the resection of normal functioning lung. Much has also been learned about the effect on pulmonary function of such diseases as obstructive emphysema, tuberculosis, and destruction of lung tissue from nonspecific inflammation.

Pulmonary function tests are an essential addition to the preoperative studies of pa-

tients with bronchiectasis. This is particularly true in the older age group, where obstructive emphysema occurs with much greater frequency, and in the far advanced cases where segmental resection with conservation of normal lung tissue is indicated.

The tests now in use in this clinic are divided into three parts. A very careful clinical appraisal is first carried out, with particular attention to allergic states, past history of work capacity, and present functional efficiency insofar as the lungs are concerned. Fluoroscopy is then performed, with emphasis on the symmetry of rib and diaphragm movement, the presence or absence of mediastinal shift, lung field clouding, and the cardiac contour. Finally, the patient has spirometric studies, including resting minute ventilation, oxygen coefficient, vital capacity (with emphasis on expiration time), and maximum minute ventilation. With the correlation of all three parts, one obtains a fairly accurate analysis of the patient's pulmonary function and can then estimate the probable decrease in function following operation. Bronchospirometry, giving the oxygen utilization for each lung, is now being instituted as an additional test in patients with pulmonary function which is markedly diminished by various types of pulmonary fibrosis.

Two of the preventable deaths resulted from postoperative pneumonia. Bronchiectasis, being a suppurative disease, presents the special problem to the anesthetist of controlling the purulent material in the bronchial tree. Maintenance of a clear airway has plagued anesthetists since the beginning of thoracic surgery, and it is particularly difficult in this disease. As was stated before, tracheobronchial aspiration by catheter was used in all of these cases. Despite this measure, contralateral and ipsilateral postoperative pneumonia resulted from spread of the disease in 8 patients. In 2 of these the pneumonic involvement was classified as minimal, producing only slight, transient elevations in temperature; chest films were clear within a few days' time. Three patients, one of whom had bilateral disease, had moderately severe spreads, with temperature elevation and roentgenographic evidence of bronchopneumonia. These responded only after a considerable period of treatment, including massive chemotherapy. Three patients with bilateral disease had very severe spreads with massive pneumonic involvement, and two of these expired. The remaining patient had a very stormy course, with temperature elevations to 39 C. (102.2 F.) daily for a week; chest films began to show clearing on the tenth postoperative day, and the patient was finally discharged after a long and complicated postoperative course.

Chemotherapy and enforced postural drainage have reduced the amount of suppuration in this disease, but have not controlled it to the point that a clear airway may be maintained under anesthesia at all times. Tracheobronchial aspiration by catheter has not fully answered the problem, as the results in this series have shown. Many instruments and methods have been devised for controlling the suppurative material in the bronchial tree, but none has really achieved noteworthy success.

We have attempted to answer the problem in our own clinic by devising an instrument which occludes the bronchus to the affected lobe during operation, thereby preventing any spillage of purulent material (fig. 1). The indications and technique for its use, and the results obtained during a two year period, have been reported elsewhere[1]. The instrument has been used in 15 operations for bronchiectasis outside of the present series; postoperative spread with secondary bronchopneumonia did not occur in any case. The presence of bilateral disease does not constitute a contraindication to the use of the instrument; on the contrary, blocking the most seriously diseased portion (which is usually removed first) prevents the spillage of a great deal of purulent material out into the major bronchi. Since suction is applied through the instrument and produces atelectasis in the lobe or lobes being removed, the surgeon is aided by having more operative space; furthermore, in cases of lobectomies, the interlobar fissure is better delineated by the atelectasis. As soon as a much smaller instrument can be made, it is planned to employ it in segmental resections for delineation of the affected segment.

Complications

The frequency of *postoperative spreads* in this series of cases, and the form of prevention employed at present have already been discussed.

Postoperative *atelectasis* occurred in 7 patients without any mortality. Five of the 7

1. Moody, J. D.: A Method of Bronchial Occlusion for the Prevention of Transbronchial Spread During Lobectomy and Pneumonectomy: Clinical Application, J. Thoracic Surg. 17:681-689 (Oct.) 1948.

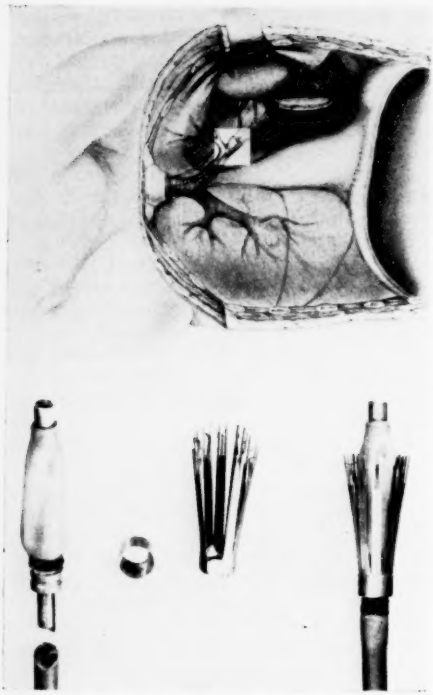

Fig. 1. The various parts of the endobronchial balloon are shown, and its use in a left lower lobectomy for lung abscess is illustrated by diagram. A water manometer under mercury pressure is used for inflation of the balloon. (From Moody, J.D.[1])

had atelectasis on the same side as the resection. Two cases were classified as severe, the atelectasis persisting over several days' time, and requiring several bronchoscopies before re-inflation finally occurred. The other 4 cases all responded nicely to bronchoscopy.

Present-day therapy directed toward correction of atelectasis has changed very little. Enforced coughing, deep breathing exercises, bronchoscopy, and intrapleural suction are methods routinely used in most clinics; they are now employed not only for the treatment of atelectasis, but for prevention as well. The use of the instrument previously described has also helped to lower the incidence of this complication by preventing the spillage of secretions into unaffected portions of the bronchial tree.

The study of the incidence of *bronchopleural fistula* and *empyema* in this series has brought out several interesting facts. As was noted previously, 7 patients had bronchopleural fistula plus empyema, while 8 had empyema alone. All patients in the former group eventually responded to tidal drainage, plus the use of open drainage in one case and unroofing procedures in two. The postoperative course was greatly prolonged in all cases. The patients with empyema also responded to the same forms of therapy after long periods of hospitalization.

The incidence of these two postoperative complications was extraordinarily high during the first few years. Between 1938 and 1940, when 14 resections were performed, bronchopleural fistulas occurred in 35 per cent and empyema in 28 per cent—a combined incidence of 63 per cent. In the period from 1941 through 1943, only 5 resections were performed and empyema occurred in 2 cases. In 1944 penicillin came into use, and the combined incidence of fistulas and empyema in 7 cases dropped to 40 per cent. In 1945, although the number of resections rose to 14, only one case of empyema occurred. In 1946, there was only one case of empyema in 18 resections.

It might be concluded that the advent of penicillin therapy caused the decline in the incidence of both bronchopleural fistulas and empyema. However, further study of these cases reveals other factors which may have played equally important parts in minimizing these complications. Prior to 1944, all bronchial stumps were closed with one or more ligatures, and in approximately half the cases a flap of pleura was used as a covering. In 1944, bronchial closure by mattress sutures was employed in 2 of the 7 cases; in 1945 this method of closure was employed in 9 of the 14 cases, and in 1946, in 11 of the 18 cases. During these three years, a pleural flap for coverage of the stump was used almost universally. It is interesting that not a single case in which the bronchial stump was closed with mattress sutures developed either a bronchopleural fistula or empyema during these three years. In the 5 cases in which either a fistula or empyema developed, the bronchial stump was closed by ligation.

It can probably be safely assumed, therefore, that bronchial closure by mattress sutures, plus the use of a pleural flap, has minimized, if not abolished, the danger of bronchopleural fistula, while penicillin therapy has practically eliminated the occurrence of empyema. Certainly these two complica-

tions, which at one time were so costly, not only in terms of lives but also in terms of prolonged hospitalization, are now practically eliminated.

Late results

The surgical therapy of bronchiectasis has markedly altered the prognosis of this disease. As was noted by Perry and King[2] in 1940, and by Bradshaw, Putney and Clerf[3] in 1941, the nonsurgical therapy of bronchiectasis left much to be desired. These authors showed that patients having symptoms since early childhood rarely lived beyond the age of 30 years; furthermore, life expectancy following the development of symptoms was only 13.5 years in the fatal cases. Bradshaw, Putney and Clerf found that, in the fatal cases, the average duration of the disease from diagnosis to death was only 1.8 years. The introduction of chemotherapy only emphasized the further need of surgical treatment; it not only made surgery safer, but, by carrying patients through acute exacerbations of their disease, converted them into chronic cases who simply live and suffer that much longer with the disease.

One cannot overlook the sociologic aspect of this disease in considering the results of therapy. There is perhaps no other field of major surgery in which therapy has been more beneficial in altering the social destiny of the patient. The prolonged struggle against this chronic disease causes gross alterations in personality, and the fact that surgery offers a cure in most instances further emphasizes the important role played by this form of therapy.

With the above principles in mind, the over-all results in this series are considered good. The fact that 40 of the 55 patients are alive and engaged in essentially normal occupations testifies to the efficacy of this form of therapy. The marked decline in the incidence of complications which has resulted from newer surgical principles and chemotherapy should continue. The mortality rate has already dropped, as has been noted in many other clinics[4], and as our own survey of statistics since completion of this particular study has shown. Furthermore, the fact that 3 of the 13 patients with bilateral disease consider themselves cured, and that 5 feel that they have been markedly benefited and are doing normal work, indicates that surgery is of value even when both lungs are involved. Certainly some of these patients should have further surgery, particularly in view of the present advantages of pulmonary function studies and the technique of segmental resection.

Present Approach

The present approach to the surgical care of bronchiectasis in this clinic embodies all of the principles discussed above. The admission diagnostic studies include bronchoscopy and bronchograms. The former is performed, not so much to localize the disease as to ascertain whether or not any secondary cause for the bronchiectasis is present. Bronchogenic carcinoma, bronchial adenoma, foreign bodies, and bronchial stenosis due to pulmonary tuberculosis are notoriously frequent in the pathogenesis of this disease. Bronchograms are performed by filling all five lobes and making stereoscopic films, not only in the posterior-anterior view but in the oblique positions as well.

During the preoperative period, which averages seven to ten days, the patient receives adequate doses of penicillin both parenterally and by aerosol; we have also found the addition of Vaponefrin to the aerosol to be quite efficacious. A check x-ray is obtained following the bronchograms, and if a significant amount of retained lipiodol persists despite precautionary measures, the patient is discharged for a six weeks' period on enforced postural drainage plus, if possible, aerosol penicillin.

Following approximately one week of chemotherapy, or when the total sputum output has been reduced as much as believed possible, pulmonary function tests are performed. These are usually done in the latter part of the day, when the patient has emptied himself of purulent secretions. These findings are correlated with the previous studies, and the decision is made as to the form of surgery indicated.

Operations for bronchiectasis are generally performed either late in the morning or early in the afternoon, following prolonged postural drainage. The time of operation is particularly important in patients with disease of long duration, since they form a definite habit of emptying the tracheobronchial tree of purulent secretions at a given time of day. Many patients will specify an exact hour when they know, through

2. Perry, K. M. A., and King, D. S.: Bronchiectasis, Am. Rev. Tubere. 41:531-548 (May) 1940.
3. Bradshaw, H. H., Putney, F. J., and Clerf, L. H.: The Fate of Patients with Untreated Bronchiectasis, J.A.M.A. 116:2561-2563 (June 7) 1941.
4. Adams, R., and Ficarra, B. J.: Appraisal of Surgery in the Treatment of Bronchiectasis, J.A.M.A. 134:240-245 (May 17) 1947.

long experience, that they will almost completely empty themselves of these secretions.

The endobronchial balloon is inserted through the bronchoscope at the beginning of the procedure, usually under local anesthesia, so as to obstruct the affected lobe.

A discussion of the surgical therapy of bronchiectasis would be completely amiss if the principle of segmental resection were not included. It has been conclusively shown by numerous studies that bronchiectasis is primarily a segmental disease, and furthermore usually involves the basilar segments. The development of the techniques of segmental resection has profoundly advanced the surgical therapy of this disease[5]. It has opened new avenues of therapy for patients with bilateral disease who were formerly classified as hopeless cripples. Furthermore, by permitting the removal of non-functioning lung only, it has made surgery possible in patients with marked reduction in pulmonary reserve who would be unfit for lobectomy.

Hilar dissection is employed, with individual ligation of all hilar structures. The endobronchial balloon is withdrawn just prior to clamping the bronchus. The bronchial stump is closed with interrupted mattress sutures, and covered with a flap of pleura. Following all lobectomies drainage by catheters is instituted both anteriorly and posteriorly, a water trap being utilized to maintain negative pressure. If, for any reason, the patient's airway is not clear at the close of the procedure, and following thorough tracheobronchial suction, bronchoscopy is immediately performed.

A roentgenogram is obtained the evening of operation to check on the degree of inflation of the remaining lung, and to detect atelectasis. Subsequent chest films are made at intervals of two to four days. The catheters are removed between the third and fifth postoperative days. In cases of segmental resection, additional positive suction is applied to the chest to maintain expansion of the lung.

The preoperative chemotherapy is continued during the postoperative phase. The patient is usually walking by the fifth to the seventh postoperative day, and is discharged between the tenth and fourteenth days. He is then followed at two to three month intervals in the chest clinic.

5. Overholt, R. H., Betts, R. H., and Woods, F. M.: Multiple Segmental Resection in the Treatment of Bronchiectasis, Dis. Chest, 13:583-595 (Nov.-Dec.) 1947.

Summary and Conclusions

The cases of bronchiectasis treated by pulmonary resection in this clinic from 1938 through 1946 are analyzed, and the improvements achieved during this period in the surgical therapy of this disease are discussed. The over-all results are considered satisfactory, particularly in view of the rapidly declining mortality and morbidity rates. A brief resumé of the present surgical approach to this disease is also presented.

CYSTIC LUNG DISEASE

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Although cystic disease of the lung has been known for more than three hundred years[1], it was not until 1925, when A. R. Koontz[2] published a review of 108 cases collected from the literature, and added one of his own, that the disease received any widespread recognition.

Incidence

Roentgenologic studies by Edwards and Ehrlich[3] revealed only 2 cases of lung cysts from a series of approximately 13,000 inductees in New York City, and Kinzer[4] found only 8 cases of cystic disease in a review of more than 105,000 chest films. These figures would indicate that the disease is far more common than has been previously suspected. We feel that, in all probability, numerous cases of cystic lung disease have been misdiagnosed. In our own cases, even though we have been quite aware of the possibility of cystic lung disease, we have frequently made the wrong diagnosis originally.

During the past five years at Duke Hospital we have searched carefully for cystic disease of the lungs in various patients who presented themselves to the Chest Clinic. Largely because we have particularly looked for the disease, we have been able to find 33 such cases during this interval.

From the Department of Medicine, Duke University School of Medicine, Durham, North Carolina.

1. Fontanus, quoted by Shanks, S. C., Kerley, P. and Twining, E. W.: A Textbook of X-ray Diagnosis, London, H. K. Lewis & Co., 1938, v. 1, p. 194.
2. Koontz, A. R.: Congenital Cysts of the Lung, Bull. Johns Hopkins Hosp., 37:340-361 (Nov.) 1925.
3. Edwards, H. R., and Ehrlich, D.: Examinations for Tuberculosis, J.A.M.A. 117:40-45 (July 5) 1941.
4. Kinzer, R. E.: The Chest X-ray Examination, J.A.M.A. 128:499-502 (June 16) 1945.

Types

Cystic disease of the lungs has been classified in most of the recent literature as either congenital or acquired[5]. It is the present feeling of the pathologists and anatomists that congenital cysts are usually lined with bronchial epithelium and that bronchial material such as cartilage and smooth muscle may be found in the walls of such cysts. Acquired cysts are thought to be due to dilatation and excavation, probably resulting from infection, and they are usually lined with an epithelial layer or inflammatory membranes.

In general, either type of cyst might be defined as a sac in the lungs which contains either air or fluid and is not occupied by alveoli or other normal lung tissue. Cysts may be single or multiple, and may be confined to one lobe, or present in all lobes. They vary in size from a minute sac to enormous cysts that occupy more than half of the entire thoracic cavity. Pulmonary alveoli lying adjacent to the cysts are usually collapsed or atelectatic.

Differential Diagnosis

It is obvious that sac-like areas caused by tuberculous infection, parasites, and coccidiodes may easily be confused with lung cysts, and the differential diagnosis must be made by the usual methods of skin testing, sputum examinations, and serologic studies. At times it is also extremely difficult to differentiate between cystic lung disease and cystic bronchiectasis and lung abscesses. Emphysematous blebs may be confused with cysts, and indeed cysts may arise in a manner similar to the formation of a bleb[6].

The symptoms of cystic disease of the lungs are extremely variable. Hemoptysis ranging from slight streaking to severe hemorrhage, cough, expectoration, dyspnea, wheezing, pain in the chest, cyanosis, cardiac palpitation, and repeated febrile attacks may all be encountered. On the other extreme, there are certain patients who have no symptoms at all and in whom the diagnosis is made more or less by accident.

Since the symptoms are so variable, it is not surprising that in a large percentage of cases an incorrect diagnosis is made at first. In our experience we have frequently confused cystic disease of the lungs with bronchiectasis, lung abscess, tuberculosis, empyema, spontaneous pneumothorax, bronchopleural fistula, carcinoma of the lung, and lung abscess. It always should be borne in mind that cystic lung disease may actually be complicated by any of these diseases or by any other pulmonary disease.

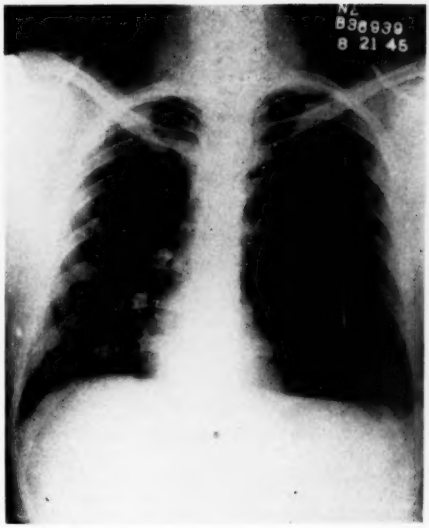

Fig. 1 (Case 1). A large cyst resembling pneumothorax.

The final diagnosis depends largely on the closest of cooperation between the roentgenologist, the internist, the surgeon, and the pathologist. Even then the diagnosis is not always entirely satisfactory, for we are frequently unable to say whether the cyst is congenital or acquired, or to tell how long it has been present or what has caused it. We can simply state that there have been cystic changes in the lungs.

The following 9 cases are reported in order to illustrate varying manifestations of the disease and the way in which it simulates other lung diseases.

Case Reports

Case 1

This 26 year old white man first came to Duke Hospital in September, 1944. There was no history of cough, sputum, hemoptysis or pain in the chest. The past history was entirely normal except for the patient's statement that he never was able to participate in extremely active sports, because of "lack of wind." In April, 1944, he was called up for military service, but was rejected and told that the roentgenogram showed that he had a pneumothorax.

General physical examination was normal except

5. Liggett, R.: Cystic Disease of the Lungs, Clin. Med. 53: 16-17 (Jan.-Feb.) 1946.
6. Miller, W. S.: The Lung, Springfield, Illinois, Charles C. Thomas, 1943, p. 62.

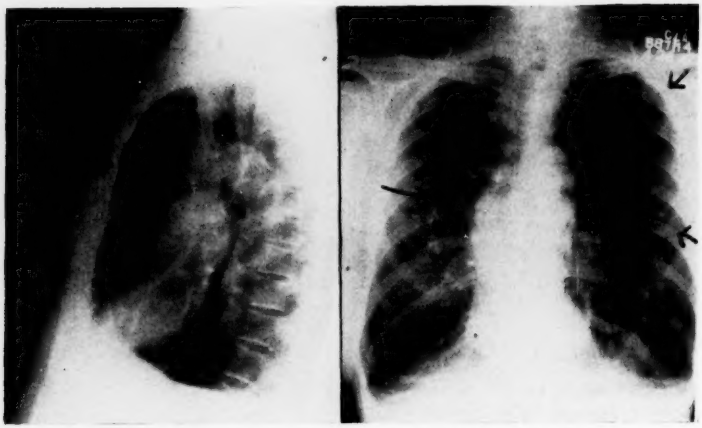

Fig. 2 (Case 2). A large cyst resembling pneumothorax, with herniation into the opposite side.

for findings over the chest. The right lung was clear. On the left breath sounds were faintly audible from the apex to the second rib anteriorly, and from the apex to the fourth rib posteriorly. From this level to the diaphragm no breath sounds could be heard.

Roentgenograms (fig. 1) showed a large cyst taking up most of the left half of the thorax and pushing the diaphragm downward. There was a small amount of apparently normal lung tissue in the region of the apex. Operation has been advised, but the patient has consistently refused any surgical procedure. He has been followed for the past several years, and has continued to enjoy good health.

This represents a case of a large solitary cyst. It is probably congenital in origin, although a definite statement could not be made without pathologic study. It has not changed over a period of four years, and the greatest danger appears to be that infection will develop in the cyst.

Case 2

This 68 year old white man was first seen at Duke in August, 1946. Ten years prior to this time he began to have slight cough and produced small amounts of mucoid sputum. At no time was there any history of acute infection. At the age of 63, he began to have some dyspnea on strenuous exertion. At 65, he was admitted to another hospital, where a diagnosis of pneumothorax and bronchopleural fistula was made. Because of increasing dyspnea he had been unable to work for the past two years.

General physical examination showed him to be a well developed and well nourished man in moderate respiratory distress. The blood pressure was 134 systolic, 88 diastolic. Breath sounds were entirely absent throughout the left side of the thorax. Breath sounds on the right were normal except for a few fine rales at the right base. The rest of the physical examination was not remarkable except for a greatly enlarged prostate causing partial obstruction. A chest film (fig. 2) showed no normal lung markings on the left side of the thorax, and there was herniation through the anterior mediastinum into the right thorax. It was felt necessary to do a transurethral prostatic resection, and prior to the operation 1200 cc. of air was removed from the left side of the chest. Initial pressures were +5 cm. of water on expiration, +1 on inspiration; final pressures were −1 and −5. This procedure temporarily relieved his dyspnea, and he withstood the operation well. Within a few hours, however, his dyspnea returned.

He was readmitted to Duke Hospital in April, 1947. He had grown steadily worse and had gotten to the point where he could neither eat nor sleep. Because of his extremely marked symptoms, it was decided to attempt a left pneumonectomy. The patient stood the operative procedure well, but went into shock immediately after operation, and died despite supportive therapy. Autopsy showed that a suture of one of the hilar vessels had cut through, and a fatal hemorrhage had ensued.

Pathologic study of the operative specimen showed that the left upper lobe was entirely replaced by a tremendous cyst, which filled the left side of the thorax, and had herniated into the right. Postmortem studies of the right lung showed numerous large so-called bullae. No bronchial obstruction was found on either side.

This case probably represented a large cyst. There is no history to suggest infection as a cause for such a change; on the other hand, the finding of bullae in the right lung makes one suspect that the cystic changes could be due to so-called bullous emphysema.

Case 3

A premature male baby, born at 7 months' gestation, died two hours after birth. The baby was born elsewhere, and no clinical observations or examinations were done.

Postmortem examination showed the left lung to be markedly distended with air, and on section a cystic area measuring approximately 2 by 2 by 2 cm. was found. No fluid was present. This area involved almost all of the left lower lobe (fig. 3).

This undoubtedly was a case of congenital cystic disease in the youngest patient of our series.

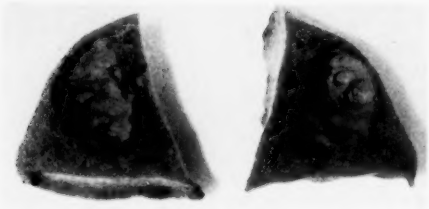

Fig. 3 (Case 3). Congenital lung cyst from a premature infant.

Case 4

This 8 year old colored boy was first seen at Duke Hospital in March, 1946. History revealed that he had had no symptoms until four weeks before admission, when he began to have chills, fever, and pain in the chest. A diagnosis of pneumonia had been made. He improved somewhat, but developed a cough productive of foul, purulent sputum.

Physical examination showed dullness over the region of the left lower lobe. Bronchial breath sounds were present in this region. The diagnosis on admission was lung abscess (fig. 4). The patient's general condition was poor, and it was decided that surgical drainage of the abscess should be attempted first. This was done, and large amounts of purulent material were removed by drainage. The patient continued to run fever, however, and the large cavity showed no signs of closing. His general condition improved somewhat, and a few weeks later a right lower lobe lobectomy was done. The postoperative course was uneventful, and the patient has remained well.

Pathologic study showed the entire right lower lobe to be made up of a large cyst. The cyst was lined with epithelium, and the walls of the cyst were made up of muscle and cartilage.

This case illustrates the difficulties in distinguishing between true lung abscess and an infected cyst. The cyst was probably congenital in origin and became infected.

Case 5

A 46 year old white man was first seen in the emergency room at Duke Hospital in October, 1945, following an automobile accident which had resulted in a fracture of the left hip. The fracture was reduced. Examination of the thorax revealed rales at both bases, and roentgenograms taken at this time showed some infiltration at both bases. The patient made a good recovery from the trauma, and was followed by his physician at home. During the following year, he was told on four occasions that he had pneumonia which appeared to be chronic.

In October, 1946, he was readmitted to the hospital. For three months preceding this admission he had been producing purulent sputum which was occasionally foul, and on other occasions blood streaked. Examination of the chest showed the percussion note to be dull over the left base, and many rales were present in this area. The white cell count was 14,000. Chest films showed an area of consolidation over the left lower lobe and patchy infiltration in the region of the right lower lobe. In view of the chronic pneumonic process, tuberculosis, fungus infection, and bronchogenic carcinoma were considered. Bronchoscopy revealed no tumor or other evidence of disease. Skin tests with old tuberculin were entirely negative, as were repeated examinations and cultures of the sputum for tubercle bacilli and fungi. The patient was treated with penicillin, both intramuscularly and by aerosol, with some improvement, and on discharge a diagnosis of chronic pneumonia, etiology undetermined, was made.

He returned one month later, having gotten worse at home. On this admission general physical examination was as before, but chest films (fig. 5) showed a large cavity in the left lower lobe. The walls were

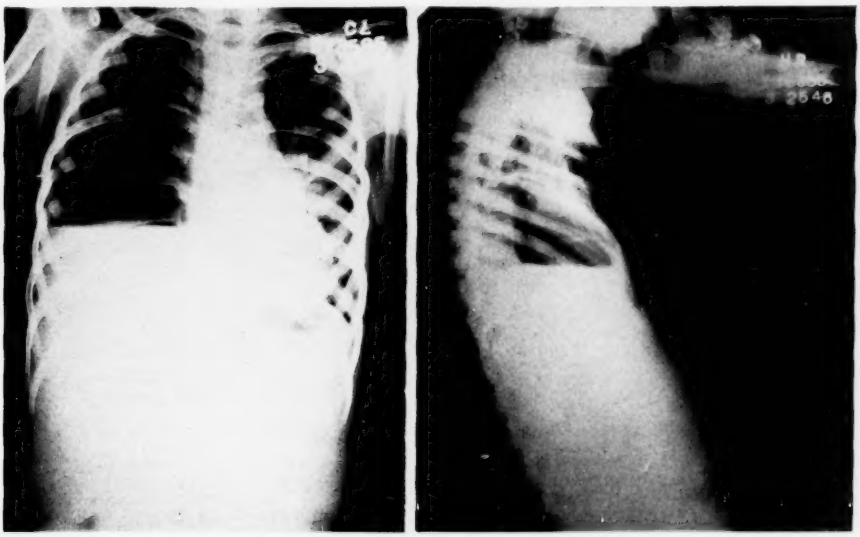

Fig. 4 (Case 4). A cyst resembling lung abscess.

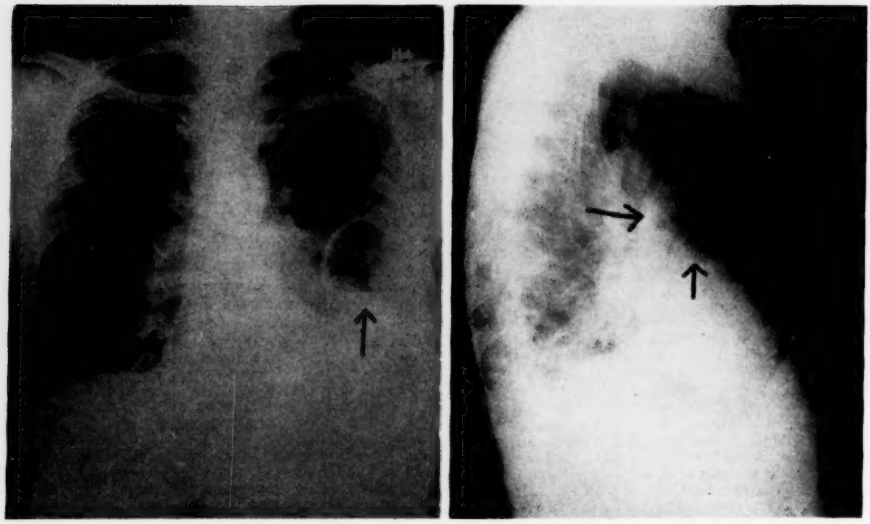

Fig. 5 (Case 5). This cyst had previously been mistaken for chronic pneumonia.

smooth and not very thick. There was still infiltration in the right lower lobe. In view of the bilateral disease, it was decided that surgical drainage rather than resection of the lobe should be performed. This was done, and a 7 cm. cavity was entered. Biopsy showed the walls of this cavity to be lined with epithelium and made up of smooth muscle.

Following this procedure the patient improved and did fairly well for the next year. He then died of a metastatic brain abscess. No autopsy could be obtained.

Whether this was an abscess or a true lung cyst which had become infected is open to question. The history and pathologic findings, however, would indicate that it was primarily a lung cyst which had become secondarily infected, and undoubtedly he had other cysts which were never demonstrated. The case illustrates how lung cysts can be confused with "chronic pneumonia."

Case 6

This 32 year old white male was first admitted to Duke Hospital in July, 1947. At this time he was complaining of general malaise, a low grade fever, and a slight, nonproductive cough. Past history showed that in 1944, while in the armed forces, he had had an unusual type of pneumonia which was finally classified as primary atypical pneumonia.

On admission to the hospital general physical examination was normal. The white blood cell count was 8,500. Roentgenograms of the chest were entirely clear. He continued to run fever, however, and five days after admission chest films (fig. 6) showed rather marked infiltration throughout both upper lobes. Tuberculin skin tests were negative, as were repeated sputum cultures for tubercle bacilli and fungi. Serial roentgenograms showed the right lung to clear rapidly, but in the left upper lobe clear, multiple, cyst-like areas without fluid developed.

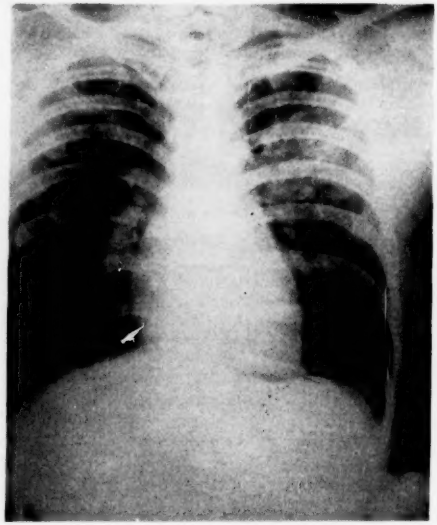

Fig. 6 (Case 6). Pulmonary lesion resembling tuberculosis or virus pneumonia.

Bronchograms were done, but the cystic areas could not be filled.

The patient was treated with bed rest and sulfonamides. The temperature became normal within fourteen days, and the symptoms disappeared. Chest films were entirely clear at the end of two months. The patient has had no further pulmonary symptoms.

This case illustrates how cystic lung disease can easily be confused with both primary atypical pneumonia and tuberculosis.

Case 7

This 27 year old colored man was first admitted to Duke Hospital in July, 1948. In January, 1945, a chest film made during a routine survey had showed infiltration of the right lung field. The patient was admitted to a tuberculosis sanatorium, where he remained for six months. He improved, and returned to work. In July, 1947, he began to have malaise and weight loss, and was readmitted to a tuberculosis sanatorium, where he remained for one year. At no time, however, was the sputum found to be positive for tubercle bacilli, although tuberculin skin tests were positive. Serial roentgenograms taken at the sanatorium showed cavities in the right middle lobe, which apparently would rapidly appear and disappear. Bronchograms were done which revealed bronchiectasis of the right middle and lower lobes, but the areas of cavitation could not be filled with lipiodol.

On admission to this hospital, the patient appeared chronically ill. His temperature ranged between 38 C. (100.4 F.) and 39 C. (102.2 F.). Examination of the chest showed the percussion note to be dull over the right lower chest, and moist rales were heard in this area. The left lung was clear. The rest of the physical examination was within normal limits. A chest film (fig. 7) showed an extensive disease process in the right middle and lower lobes. Bronchograms were repeated, and the cavities could not be filled. The patient was treated with penicillin and repeated drainage by bronchoscopy. He was discharged home for several weeks to reduce the amount of retained lipiodol by postural drainage.

He was again admitted to Duke Hospital on November 18, 1948. General physical examination was as before. A right pneumonectomy was performed on this admission and was followed by an uneventful recovery.

Pathologic study showed definite bronchiectasis in the right middle and lower lobes. One large cyst and several small cysts filled with brownish fluid were present. The cysts were lined with stratified squamous epithelium, and there were some chronic inflammatory changes. Similar cystic disease was found in the right upper lobe, but in this region there was no evidence of infection. There was no obvious communication between the cysts and the deformed bronchi.

This case probably represents acquired cystic disease associated with bronchiectasis. It illustrates how easily cystic changes can be confused with pulmonary tuberculosis.

Case 8

This 67 year old white man was first admitted to Duke Hospital on June 30, 1948. He had no pulmonary symptoms. Chest films made during a routine survey taken two years before had been reported as normal. A survey film (fig. 8) taken four weeks prior to admission, however, showed a tumor-like mass just to the right of the mediastinum, and carcinoma was suspected.

Physical examination was normal. Bronchoscopy was inconclusive. An exploratory thoracotomy was done, and the right lower lobe was removed. The patient made an uneventful recovery and was discharged on July 18, 1948.

Pathologic study of the right lower lobe showed a good sized cyst lined by a thin wall which was made up of bronchial epithelium and smooth muscle tissue. There was no evidence of neoplasm or infection.

This case illustrates the difficulty of differentiating between certain cases of cystic lung disease and bronchogenic carcinoma.

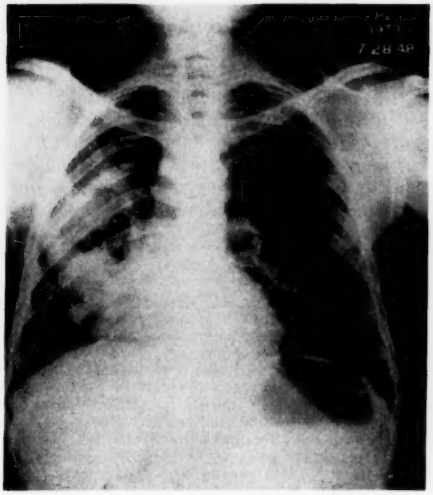

Fig. 7 (Case 7). A lung cyst resembling tuberculosis.

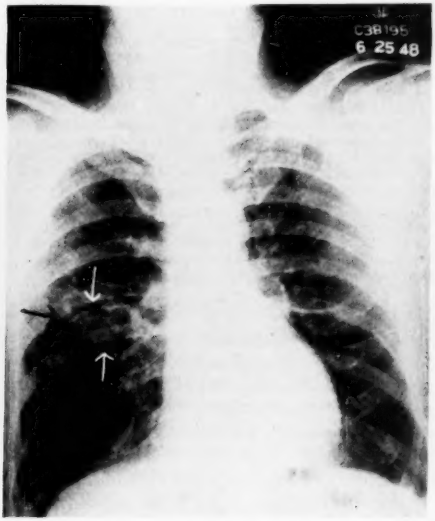

Fig. 8 (Case 8). This cyst in an elderly male resembles a neoplasm.

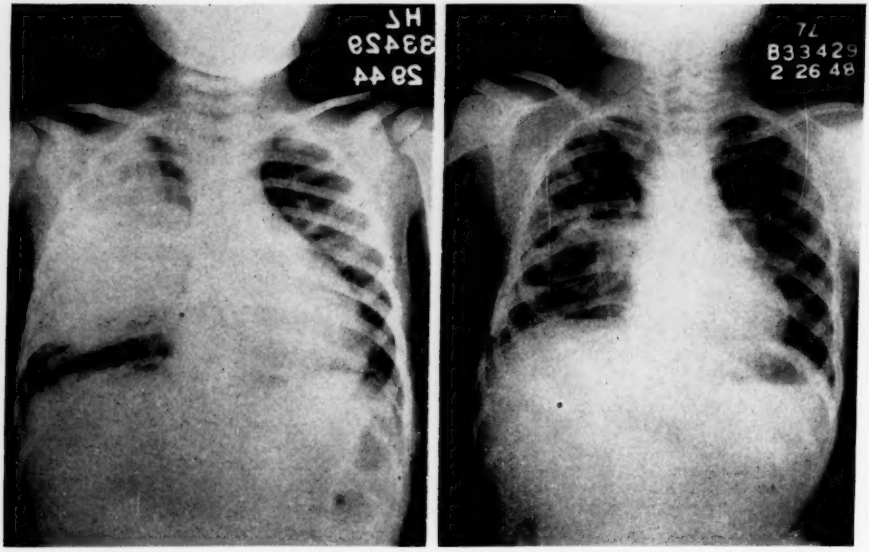

Fig. 9 (Case 9). Empyema secondary to infected lung cysts.

Case 9

This patient was first seen in 1945, at the age of 2. She had had no symptoms until three weeks prior to this admission, when she developed sore throat, cough, and fever.

Physical examination showed an acutely ill baby with a temperature of 39.5 C. (103.1 F.). The white cell count was 20,500. The percussion note was dull and there were depressed breath sounds over the right lung. The diagnosis of empyema was obvious, and penicillin therapy was started. There was insufficient improvement, however, and drainage of the empyema had to be done. After this, the lungs could be clearly visualized, and numerous cysts were seen throughout the right lung (fig. 9). Cystic bronchiectasis was suspected, but bronchograms were entirely normal.

In view of the excellent progress this patient has made since the initial episode, and the absence of symptoms, no further operation has been done, but it seems likely that a right pneumonectomy will have to be performed when she is older.

Summary and Conclusions

Despite numerous articles published during the last ten years on cystic lung disease[7], it is still considered rare. It is probably far more common than many people suspect, however, and it seems likely that many cases of cystic lung disease have been erroneously diagnosed and the underlying pathologic changes have been missed. The terminology and classifications applied to the disease have been confusing. It would seem wise to consider all abnormal sac-like areas of the lung which have no definite etiologic origin as cystic disease of the lung.

Most authors have advocated extirpation as the treatment of choice. The presence of bilateral cystic changes, however, may be a definite contraindication to operation.

Thirty-three cases of cystic disease of the lungs have been seen at Duke Hospital from 1943 through 1948. Nine of these cases are reported, in an effort to emphasize the protean manifestations of this disease, and to illustrate how easily the symptoms and signs may simulate the more common pulmonary diseases and hence cause an erroneous diagnosis.

7. Brantigan, O. C.: Cystic Disease of the Lung, Dis. Chest, 15:192 207 (Feb.) 1949.

The importance of careful physical examinations.—There is no benefit in skimping on examinations to the point where they become mere ritual and the results are merely collections of records which are filed away and not utilized. The actual value of personal health guidance is determined by the wisdom and feasibility of the advice. Effectiveness is predicated first by the comprehensiveness of the analytic data obtained and secondly by the wisdom of the medical adviser. It is here that individual physicians in private practice can render the greatest aid to the preventive medicine of the future.—Edward J. Stieglitz: A Future for Preventive Medicine, New York, The Commonwealth Fund, 1945, p. 58.

THE PRESENT DAY USE OF ARTIFICIAL PNEUMOTHORAX

JOSEPH S. HIATT, JR., M.D.

McCAIN

The use of artificial pneumothorax in the treatment of pulmonary tuberculosis is decreasing in frequency. Some of the more obvious factors responsible for this decrease are: (1) the acceptance and increased use of pneumoperitoneum as an elective form of collapse; (2) the more frequent use of thoracic surgery; (3) more careful selection of suitable cases; (4) continuation of pneumothorax only when it is effective. Streptomycin has caused a critical re-evaluation of all forms of collapse therapy, and the use of this drug has made it possible to apply with safety certain forms of collapse therapy, including pneumothorax, where previously a hazardous situation would have been created. Although pneumothorax is now used with greater caution and specificity than ever before, it is still accepted as the most desirable form of collapse therapy among the temporary or reversible procedures.

Indications and Contraindications

In a consideration of present day indications and contraindications for pneumothorax, it is obvious that certain changes have been brought about by the use of streptomycin. No attempt will be made to discuss the varied indications. The two indications which are generally accepted are (1) cavitation with positive sputum, lung destruction not too extensive; and (2) progressive disease not responding to bed rest and predominantly, if not entirely, unilateral.

Rafferty[1] has listed the following contraindications to the use of pneumothorax:

"1. The parenchymal disease is of such type and/or extent as to require permanent collapse.
"2. The chances of serious pleural infection are prohibitive.
"3. Bronchial disease makes atelectasis and serious sequelae probable."

All of these major contraindications have been altered by the use of streptomycin, and the indications for pneumothorax have been broadened.

There is still no universally accepted opinion as to the use of pneumothorax in minimal tuberculosis. There is, however, general agreement that the incidence of complications of artificial pneumothorax will be kept at a minimum if proper basic concepts of the application and use of pneumothorax are followed. Greater care than ever should be exercised in the selection of cases to receive pneumothorax, and one should be always on the alert in continuing this form of treatment. If pneumothorax cannot be made effective by pneumonolysis or the addition of a temporary phrenic nerve crushing, it should be abandoned promptly.

The widespread practice of giving pneumothorax to "stretch adhesions" to allow pneumonolysis is in disfavor. Exploratory thoracotomy should be done as early as possible after the presence of adhesions is noted or when there is failure to obtain good collapse. The purpose of this procedure is to secure satisfactory collapse before the formation of pleural fluid complicating an ineffectual collapse. The readiness to abandon a pneumothorax that cannot be rendered effective has definitely lessened the frequency of complicating empyema.

Exudative lesions

When the lesion is of an acute, exudative character and the dangers of complicating pleural effusion under ordinary circumstances are great, pneumothorax may be employed with a good margin of safety if streptomycin is given systemically to allow a "cooling off" period. There is reason to believe that the acute, exudative lesion near the periphery of the lung field will have less opportunity to cause pleural symphysis if streptomycin is properly used—although, of course, factual proof is lacking at this time. Thus a situation which many previously would have regarded as a contraindication to pneumothorax is now changed in those instances where there is a good response to streptomycin, and pneumothorax is given an increased margin of safety.

Endobronchial disease

With the proved specificity of streptomycin for endobronchial lesions, there is a growing tendency to subject all prospective candidates for pneumothorax to diagnostic bronchoscopic examination. This statement does not imply that all who have any demonstrable involvement of the bronchi are given streptomycin. Instead, it means a careful evaluation as to whether the visible endobronchial disease can be expected to interfere with collapse. When sufficient changes

From The North Carolina Sanatorium, McCain, North Carolina.

1. Rafferty, T. N.: Artificial Pneumothorax in Pulmonary Tuberculosis, New York, Grune & Stratton, 1944, p. 188.

are evident to justify the use of streptomycin, the lesions are followed bronchoscopically during streptomycin therapy until they are healed or sufficiently improved to allow induction of pneumothorax.

If there are clinical symptoms or physical signs of endobronchial disease, without radiographic or bronchoscopic evidence of such disease, it is probably safest to assume that there is enough endobronchial involvement beyond the point of visualization to warrant the use of streptomycin. Then, depending upon the clinical response, pneumothorax could be instituted during or after drug therapy. If streptomycin is given for endobronchial disease before fibrous stenosis develops, this serious complication should occur with much less frequency. By careful evaluation of the bronchial tree and application of specific drug therapy where indicated, pneumothorax can be withheld in situations which will predispose to atelectasis and an unexpandable lung.

Pleural fluid

When, in spite of conventional therapy, pleural fluid continues to recur as a complication of an effectual pneumothorax, the use of streptomycin may cause absorption or prevent further formation of fluid, avoiding the formation of empyema and allowing the safe continuation of pneumothorax which otherwise would have been abandoned.

Practically always a small amount, at least, of free pleural fluid forms shortly after a closed intrapleural pneumonolysis. In the vast majority of cases this is a benign affair. In a few instances there is massive accumulation of pleural fluid and severe clinical reaction. If the pleural fluid is removed as indicated (often daily) and streptomycin administered intramuscularly, the result is usually satisfactory. Within a few days fluid ceases to form and pneumothorax can be continued. There is now little reason for tuberculous empyema to occur as a postoperative complication of this procedure. Prompt subsidence of the pleuritis causing the formation of fluid should greatly lessen permanent pleural damage.

Duration of Treatment

One of the most important changes to come about recently in the use of pneumothorax is in the duration of treatment. Formerly the time limit was thought to be determined by the extent of the original disease for which pneumothorax was given; if the disease was limited, pneumothorax was to be given for three years, but if the process was extensive, it was to be maintained for at least five years, provided complications did not arise.

Now it is felt that pneumothorax should be continued no longer than two and one half years from the time it becomes effectual, as demonstrated by conversion of sputum to negative and radiologic demonstration of cavity closure[2]. If pneumothorax has not brought the disease under control in two and one half years, some other form of collapse therapy is indicated. Continuation of pneumothorax where disease still is active in the collapsed lung inevitably promotes the formation of pleural fluid, with or without eventual empyema.

It is not an easy matter in many instances to persuade a patient who is apparently getting along well under pneumothorax to give up the form of treatment which he is sure has put him on his feet and enabled him to earn a livelihood again. In many instances the attending physician is equally reluctant to advise discontinuance of pneumothorax, because of the fear of reactivation of the disease. Actually, continuation of pneumothorax beyond the prescribed period of time invites serious complications, including pleural effusion, empyema, and resulting unexpandable lung. Because of the possibility of air embolism in pneumothorax refills, it is not desirable to subject a patient to the procedure any more often than necessary.

We have recently observed several cases in which pneumothorax has been given for four to five years. Upon its discontinuance and re-expansion of the collapsed lung, cavitation has been found to exist still in its original site or in the area of original disease for which pneumothorax was given. Some of these patients have already had a thoracoplasty; others will be subjected to this procedure in the near future. Needless to say, the majority of these patients are convinced that their pneumothorax should not have been abandoned!

Summary

The importance of proper selection of cases to receive pneumothorax is worthy of frequent re-emphasis. Only an effectual pneumothorax should be continued, and the

2. Willis, H. S.: Personal communication.

general acceptance of this principle has produced a decrease in the incidence of complicating empyema. By the intramuscular use of streptomycin the majority of active endobronchial lesions can be controlled, if not entirely healed, so that pneumothorax may be safely induced. Pleural effusion complicating pneumothorax and following closed intrapleural pneumonolysis may be controlled in many instances by the use of streptomycin intramuscularly, allowing continuation of pneumothorax and avoiding serious complications. The use of streptomycin to allow a "cooling off" period for exudative lesions allows subsequent safe induction of pneumothorax and may possibly prevent the formation of pleural adhesions, though this last statement remains to be proved.

The decision to continue pneumothorax for no longer than two and one half years after it has become effective is based on sound evidence. Continuation of a pneumothorax beyond the specified period of time invites disaster—namely, empyema, an unexpandable lung, or both. In view of the lowered mortality and increasingly good results in thoracic surgery, the proper operative procedure should be resorted to if active disease is demonstrated in a re-expanded lung.

Conclusions

1. Pneumothorax is still the most desirable form of collapse therapy where a temporary or reversible procedure is indicated.

2. The complications of pneumothorax have been greatly reduced by a more careful selection of cases and by prompt abandonment of any pneumothorax which cannot be made effectual.

3. The use of streptomycin to prepare patients for pneumothorax is recognized. It is employed chiefly in patients with endobronchial disease or exudative lesions peripherally situated.

4. The use of streptomycin may allow continuation of pneumothorax in situations which previously would have resulted in serious complications.

5. The continuation of pneumothorax for more than two and one half years from the time it became effectual invites the disaster of empyema or an unexpandable lung.

The clinical and X-ray pictures of virus pneumonia may at times be duplicated by early acute tuberculosis, and patients diagnosed as having virus infections should not be dismissed until the chest films are entirely clean.—David T. Smith, M.D., Am. Rev. Tuberc., April, 1948.

CHEST INJURIES

CLARENCE E. GARDNER, JR., M.D.

DURHAM

Modern methods of rapid transportation, together with refinements in agents of destruction which will bring the next war to the civilian population, make an understanding of the emergency and hospital management of injuries important.

Injuries to the thorax in military and civilian practice are not as frequent as injuries of the extremities[1]. Chest wounds occur twice as frequently as abdominal wounds, however, and are of especial importance because of the high mortality which accompanies them.

Nonpenetrating injuries of the thorax may result from falls, automobile accidents, or the impact of a falling structure, an animal's hoof, or a bomb blast. Penetrating wounds may be caused by ice picks or knives, or by bullets, shell fragments, or secondary missiles put in motion by explosions.

When the thorax is injured, the one consideration of major importance is the maintenance of an adequate respiratory exchange so that death from asphyxiation does not ensue. In the case of an abdominal injury, the major consideration is the possibility of peritonitis resulting from perforation of a hollow viscus, or exsanguination resulting from a ruptured liver or spleen. When an extremity is wounded, the physician's major concern may be to stop bleeding, to prevent a serious infection, or to restore function. In chest wounds, however, blood loss and infection are secondary considerations. While fatal hemorrhage into the pleural cavity following injury is possible, this rarely occurs in the individual who lives long enough to get to a doctor. Infection in the lung or pleural cavity may also be a troublesome complication of chest injuries, but this occurs later and is not a matter of immediate concern.

Any one of the following four conditions may seriously disturb respiratory exchange following injury: (1) contusion of the lung, (2) loss of stability of the chest wall, (3) pneumothorax, and (4) hemothorax. Each

From the Department of Surgery, Duke University School of Medicine, Durham, North Carolina.

1. (a) Cutler, E. C.: Military Surgery, United States Army, European Theatre of Operations, 1944-1945, Surg., Gynec. & Obst. 82:261-274 (March) 1946.
(b) Gardner, C. E., Jr.: Air Force Battle Casualties, Arch. Surg. 53:387-106 (Oct.) 1946.

may occur alone or in any combination, and may follow either nonpenetrating or penetrating wounds. Penetrating injuries may call for special treatment if a sucking wound is produced, or if a foreign body is retained in the chest wall, lung, or pleural cavity. Each of these conditions will be discussed in detail.

Contusion of the Lung

The lung may be contused by blows, crushes, or bomb blasts. All degrees of contusion and laceration may exist, from minor degrees of petechial hemorrhages and edema to crushes and lacerations of major vessels and bronchi. Pneumothorax, hemothorax, mediastinal emphysema, and fractures of ribs or sternum may also be present. In young children severe crushing injuries may occur without fractures of the bones of the thoracic cage. In adults serious degrees of lung contusion and laceration without rib fractures can occur from bomb blast.

Ordinarily, if the degree of lung contusion is not severe, the only evidence of its presence will be a little chest pain with bloody expectoration. If the contusion is bilateral and extensive, serious interference with respiratory exchange may result from the filling of alveoli and bronchi with blood and tissue fluid. In this situation the patient may drown in his own body fluids if he is unable to empty the trachea and bronchi of these fluids. Assistance, if necessary, can be given by suction through a catheter inserted into the trachea[2], or it may be necessary to remove secretions through a bronchoscope.

This condition has been described in the literature of the recent war as "traumatic wet lung." Brewer, Burbank, Sampson, and Schiff[3] have indicated that other factors besides lung contusion may enter into the picture. These are excessive reflex secretions of bronchial fluids secondary to trauma, anoxia, or tracheal obstruction; and inability to expel fluids adequately from the bronchial tree because of pain or instability of the chest wall resulting from multiple rib fractures, or inhibition of the cough reflex by oversedation or head injury.

Loss of Stability of the Chest Wall

If stability of the chest wall is lost, as is the case when a group of ribs are fractured in two places or the sternal plate is separated from the ribs by multiple fractures (fig. 1), that portion of the chest wall detached from the stable rib cage will move in the opposite direction from the rib cage with each respiration, causing embarrassment to respiratory exchange. When the rib cage is elevated in inspiration, the detached segment is sucked in. Conversely, when the rib cage falls in during expiration, the mobile and unstable section is pushed out.

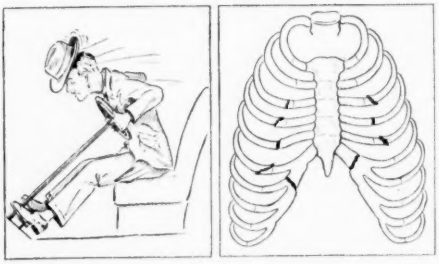

Fig. 1. One method by which the sternal plate may be separated from the thoracic cage by multiple fractures near the costochondral junctions.

This condition is painful, and causes cyanosis, dyspnea, and apprehension. It may prove fatal in a short time, particularly if it exists with other injuries to the lung and pleura, as is often the case.

The condition is not difficult to recognize if it is kept in mind. One look at the patient shows his anxious expression, labored breathing, and cyanotic color, while observation of the chest wall during each respiration will show the paradoxical movement of the mobile segment of the thoracic cage.

Some method to stabilize the mobile segment of the chest wall is urgently necessary to control pain and relieve anoxia. Adhesive strapping will usually stabilize the "stove-in" chest which follows multiple rib fractures. In the case of the detached sternal plate, wires may have to be placed under costal cartilages on each side of the sternum and attached to overhead traction with weights and pulleys.

Pneumothorax

Air may enter the pleural cavity from an open wound, or from nonpenetrating injuries where the lung is torn by a blow or crushing injury or by the sharp end of a fractured rib. When unaccompanied by other injuries

2. Haight, C.: Intratracheal Suction in the Management of Postoperative Pulmonary Complications. Ann. Surg. 107: 218-228 (Feb.) 1938.
3. Brewer, L. A. III, Burbank, B., Samson, P. C., and Schiff, C. A.: The 'Wet Lung' in War Casualties. Ann. Surg. 123: 343-362 (March) 1946.

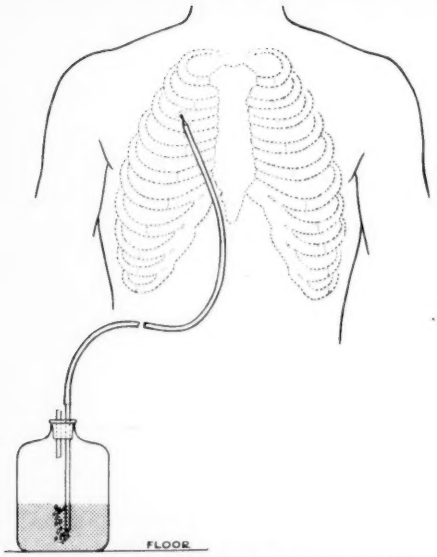

Fig. 2. Method used in treating a tension pneumothorax. A venipuncture needle is inserted in the second intercostal space and attached to an underwater seal.

or by a sucking wound or tension pneumothorax, its presence is of little consequence. The air is usually absorbed in a few days. If its presence is contributing to respiratory embarrassment, it may be removed by aspiration with a needle and syringe.

Tension pneumothorax

Tension pneumothorax is a serious condition which may lead to death from asphyxia if not relieved promptly. It develops when a valve-like tear occurs in the pleura over the lung. With each inspiratory motion the valve-like flap of pleura opens, and air enters the pleural cavity. With each expiration the flap closes, and no air leaves the pleural cavity. Air is thus pumped into the pleural cavity with each respiratory motion. The lung is collapsed, and as positive pressure builds up the mediastinum is displaced toward the unaffected lung, which is compressed. Unless the air is released promptly, death may ensue.

Tension pneumothorax is recognized by the cyanosis and dyspnea which are present, plus the finding of a hyper-resonant chest with the trachea and heart displaced away from the affected side. It may be promptly relieved by thrusting a venipuncture needle through the second interspace anteriorly and connecting it to an underwater seal (fig. 2), or to a finger cot with the end slit. Either method allows air to escape with each expiration, but allows none to enter. This simple maneuver is life saving when tension pneumothorax is present.

Generalized subcutaneous emphysema

If a tension pneumothorax exists and there is also a tear in the parietal pleura, it may be that the air released into the pleural cavity with each inspiration is forced out into the tissue planes of the thorax with each expiration. Instead of inflating the pleural cavity, the patient pumps air out into his tissues with each respiratory motion. He may thus pump himself up like a balloon, the air going from the top of his head to his toes. As in the management of tension pneumothorax, the progressive escape of air into the tissues can be stopped simply by inserting a needle into one of the interspaces anteriorly and attaching it to an underwater seal. The air in the subcutaneous tissues is then absorbed in a few days.

Ordinarily the escape of air into the pleural cavity in a tension pneumothorax stops after several days of underwater drainage as described. If it does not, an open thoracotomy may be necessary to remove a rib fragment that may be holding the pleural tear open, or to close a lacerated bronchus.

Hemothorax

Bleeding into the pleural cavity in patients who survive long enough to reach a hospital usually occurs either from the lung or from intercostal or internal mammary vessels of the chest wall (fig. 3). The dangers of its presence include acute blood loss, interference with respiratory exchange, and loss of lung function, with possible infection if a massive clotted hemothorax or a fibrothorax develops.

Bleeding from the lung stops spontaneously as the lung collapses, while bleeding from the chest wall may have to be controlled by operation. If the patient is received in shock and the blood pressure, once restored by transfusion, drops again, the possibility of continued bleeding from an intercostal or internal mammary artery must be considered. If blood in the pleural cavity reaccumulates rapidly after repeated aspiration, the suspected area must be explored, bleeding vessels ligated, and the blood and blood clot evacuated. It is surprising, however, how rarely this complication develops.

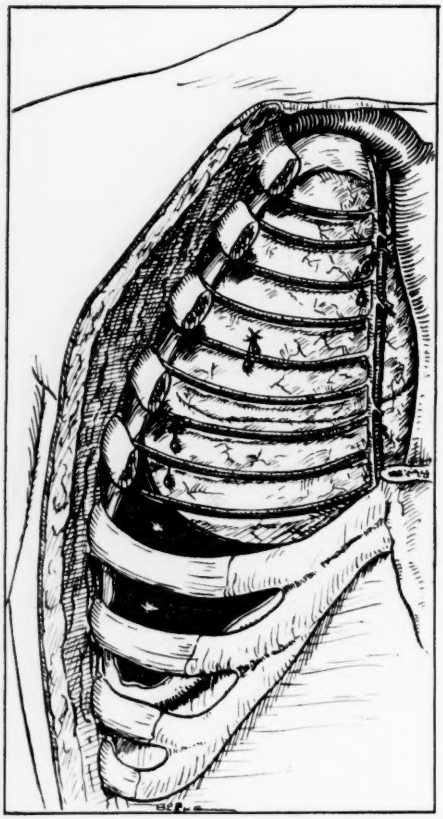

Fig. 3. Hemothorax may arise from a lacerated lung or tear of the intercostal or internal mammary artery. The blood collects above the diaphragm.

The treatment of hemothorax which is not attended by continued bleeding has been a subject of controversy in the past. Some have advised leaving the blood alone if it causes no respiratory embarrassment[4]. Others have recommended withdrawing the blood, but only after three or four days, and then replacing it with air, in the belief that re-expansion of the lung would cause bleeding from the lung to begin again[5].

As a matter of fact, we have never seen bleeding from a lung recur after early aspiration of a hemothorax, while we have repeatedly been impressed by the harmful effect of allowing blood to remain within the pleural cavity.

Contrary to popular belief, blood which escapes into the pleural cavity clots promptly in most cases. As it clots, the churning motions of heart and lung defibrinate the clot, so that fibrin is deposited on parietal and visceral pleuras and liquid defibrinated blood remains in the pleural cavity[6]. In most instances of small or uncomplicated hemothorax, this defibrinated blood and the fibrin are absorbed without deleterious effect. If larger collections of blood are neglected, particularly when complications exist, secondary clotting may occur, producing the crippling effect of a clotted hemothorax.

Sellors[6] has shown that the fibrinogen content of an untapped hemothorax rises from an initial level of zero to a level higher than that in the blood after a week or so. This reaccumulation of fibrinogen, which comes from the inflammatory exudate stimulated by the presence of blood, causes secondary clotting to occur, with the deposition of additional layers of fibrin over pleural surfaces. In patients whose hemothorax has been neglected, gradually increasing layered deposits of fibrin accumulate on the parietal and visceral pleura and in trabeculated masses in the pleural cavity. The layer covering the lung imprisons it and prevents its re-expansion; that covering the parietal pleura immobilizes the chest wall; while the trabeculated deposits of fibrin within the pleural cavity make aspiration of the hemothorax impossible.

The harmful effect of leaving blood in the pleural cavity is probably greater in war wounds, where other causes of inflammation (foreign bodies, traumatized tissue, low grade infection) are present within the pleural cavity in addition to blood. However, the possibility of this secondary clotting emphasizes the advisability of early and repeated aspirations of blood in hemothorax resulting from civilian injuries as well as military ones. If air is introduced, the only result is an apical collapse and a prolongation of the period of time required for expansion of the lung.

Because of these facts, it is now generally

4. (a) Elkin, D. C. and Harris, M. H.: Injuries to the Chest, Ann. Surg. 113:688-696 (May) 1941.
   (b) Holman, E.: Experiences with Chest Wounds from the Pacific Combat Area, Ann. Surg. 119:1-25 (Jan.) 1944.
5. Bibliography quoted by De Bakey, M.: The Management of Chest Wounds: A Collective Review, Internat. Abstr. Surg. 74:203-237, 1942; in Surg., Gynec. & Obst. (March) 1942.
6. Sellors, T. H.: Haemothorax, Lancet 248:143-144 (Feb. 5) 1945.

Fig. 4. Method of removing blood from the pleural cavity.

agreed[7] that a hemothorax is best managed by *early and repeated aspirations*, in an effort to keep the pleural cavity dry and the lung fully expanded at all times. It has been our policy to withdraw all the blood that can be obtained (fig. 4), beginning twenty-four hours after the injury, or earlier if the hemothorax causes respiratory embarrassment. The volume of blood removed is determined by the patient's reaction. A complaint of tightness in the chest is taken as an indication to stop the aspiration. From 500 to 1000 cc. can usually be removed at each thoracentesis. Aspirations are continued daily or every second day until the chest is dry and remains so.

Clotted hemothorax or chronic fibrothorax

In most cases blood in the pleural cavity, though it clots at first, quickly becomes liquid as it is defibrinated by the action of the lung and heart. In a small proportion of cases (about 5 per cent) either massive clotting of the blood occurs immediately, or a large accumulation of fibrin, developing later, prevents its removal by aspiration. In the first instance, clotting is probably due to the sudden development of a massive hemothorax which completely collapses the lung and thus eliminates the defibrinating action of its motion. In the second, which is usually the result of delayed aspiration, a time is reached about four or five weeks after injury when massive accumulations of fibrin and isolated pockets of serum develop within the pleural cavity and cannot be aspirated. In this case, the fibrinogen introduced into the pleural cavity, together with the inflammatory exudate produced by the trauma and retained liquid blood, causes a secondary clotting and deposition of additional fibrin over pleural surfaces, as already described. In either event the lung is crippled and held collapsed, and the chest wall and diaphragm are immobilized by the dense fibrous scar which forms over parietal and visceral pleural surfaces.

In the case of a massive clotted hemothorax, the thorax on the affected side is ballooned out at first and moves freely with respiration. In the case of the chronic fibrothorax, which develops after four or five weeks, the affected side of the thorax is smaller and moves little or not at all on respiration. Intercostal spaces are narrowed, and the trachea is sometimes deviated to the affected side.

In the past these conditions have been poorly understood and usually badly managed, because no one surgeon saw enough of them to formulate a policy for their management. One of the real contributions of military medicine[8] has been the development of the concept that the only way to prevent infection in the lung and pleural cavity, and to allow the imprisoned and collapsed lung to re-expand, is to remove the thickened scar which envelops the lung and coats the chest wall and diaphragm. The procedure is called decortication. It includes the removal of all clot, the careful dissection of the thickened pleural scar off the entire lung, and the removal of the scar from the mediastinum, chest wall, and diaphragm. The same procedure is used in cases of infected, clotted hemothorax or fibrothorax[9].

Penetrating Wounds

To the hazards associated with the conditions already discussed, penetrating wounds add the possibility of infection, retained foreign body, or open pneumothorax, with possibly a sucking wound and mediastinal flutter.

Most of the penetrating wounds in civilian

7. Gardner, C. E., Jr.: Chest Injuries: Application of Military Experience to Civilian Practice, Surg. Clin. North America 26:1082-1094 (Oct.) 1946.

8. (a) Churchill, E. D.: The Surgical Management of the Wounded in the Mediterranean Theater at the Time of the Fall of Rome, Ann. Surg. 120:268-288 (Sept.) 1944.
(b) De Bakey, M. and Carter, B. N.: Current Consideration of War Surgery, Ann. Surg. 121:545-563 (May) 1945.

9. Sanger, P. W.: Decortication in Acute Empyema Thoracis, Surg., Gynec. & Obst. 82:71-80 (Jan.) 1946.

life (produced by ice picks, "switch" knives, and small caliber missiles) will not require operative treatment. The mechanics by which a sucking wound produces asphyxia is well known, and the need to close such a wound promptly is taught in all first aid classes. Fortunately this condition is rarely seen in civilian practice. If the wound is large or sucking or if ribs are splintered, debridement of the chest wall with closure of the pleural cavity is necessary. Military experience has shown that irregular shell fragments larger than 1 cm. in diameter and indriven rib fragments should be removed, as their retention often leads to infection or hemorrhage. This removal can usually be accomplished through the wound of entrance, unless the entrance is through the apex of the lung, in which case a thoracotomy at the site of election is indicated. In civilian practice smooth, small caliber bullets can probably be left alone with safety, unless they occupy a position close to a major vessel or bronchus.

Summary and Conclusions

When the thorax is injured, the one consideration of major importance is the maintenance of an adequate respiratory exchange so that death from asphyxia does not ensue.

Contusion of lung tissue, if widespread, may cause serious interference with respiratory exchange from filling of alveoli and bronchi with blood and tissue fluid. If the patient is unable to rid himself of these fluids, he must be assisted by the passage of an aspirating catheter into the trachea, or by bronchoscopic drainage.

Loss of stability of the chest wall, resulting from multiple fractures of a series of ribs or detachment of the sternal plate from the thorax by fractures near the costochondral articulations on each side, may cause severe pain and anoxia. It can be relieved by adhesive strapping, or, in the case of detachment of the sternal plate, by overhead traction through wires inserted under costal cartilages on each side of the sternum.

Tension pneumothorax is a serious condition which may lead to death from asphyxia if not relieved promptly. Relief can be accomplished easily by inserting a needle into the pneumothorax cavity and connecting it to a finger cot with a slit in its end, or with rubber tubing to an underwater seal.

Hemothorax is best treated by repeated aspirations of the liquid blood, beginning on the day following the injury and repeating the chest tap daily so that the pleural cavity is kept dry and the lung fully expanded at all times. Neglect of a hemothorax may lead to the crippling effect of a massive clotted hemothorax or a chronic fibrothorax, either one of which will require a decortication operation.

Penetrating wounds add to the hazards of the above conditions the possibility of an open pneumothorax with a sucking wound, or a retained foreign body. If the wound is sucking, if tissues of the chest wall are contused, or if ribs are splintered, debridement of the chest wall, with closure of the pleural cavity, is necessary. Missiles larger than 1 cm. in diameter or indriven fragments of ribs within the pleural cavity, lung, or mediastinum should be removed, as their retention often leads to infection or hemorrhage.

ACUTE LYE POISONING IN CHILDREN

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and
HUGH P. BRAWNER, M.D.
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Lye poisoning in children has been reported frequently from Duke Hospital[1], and the following points have been repeatedly emphasized. Lye is commonly used throughout the South as a cleansing agent. A solution of lye, washing powder, drainpipe cleaner, or paint remover constitutes a grave danger when carelessly left within the reach of the thirsty or inquisitive toddler. Even with the early institution of accepted therapeutic measures the results are poor; patients not so treated are subjected to painful and hazardous therapy and prolonged hospitalization. If education and general preventive measures do not prove more effective in reducing the incidence of this condition, legal control over the dispensing of this agent should be instituted[2].

At Duke Hospital, from 1930 until the

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1. (a) Martin, J. M. and Arena, J. M.: Lye Poisoning and Stricture of the Esophagus, South M. J. 32:286-290 (March) 1939. (b) Crowe, J. T.: Poisoning Due to Lye, Am. J. Dis. Child. 68:9-12 (July) 1944. (c) Kermodle, G. W., Taylor, G., and Davison, W. C.: Lye Poisoning in Children, Am. J. Dis. Child. 75:135-142 (Feb.) 1948.
2. Taylor, H. M.: A Preliminary Survey of the Effect Which Lye Legislation Has Had on the Incidence of Esophageal Stricture, Ann. Otol., Rhin. & Laryng. 44:1157-1158 (Dec.) 1935.

present, a total of 164 patients have been treated for lye poisoning, or for burns of the mouth, pharynx, trachea, or esophagus due to lye. Eighty-five per cent of these patients were under 6 years of age, the peak incidence (51 per cent) occurring at the age of 2. The majority of these children were not seen until esophageal strictures had developed (table 1). However, it is encouraging that all but one of the 14 new patients seen in the last year were treated in the acute phase of the burns.

Table 1

Type of Case	*No. Cases*	*Per Cent*
Showed definite stricture	108	66
Received early dilations	38	23
Followed without therapy	5	3
Died during acute phase	5	3
Miscellaneous	8	5
Total	**164**	**100**

The initial first aid treatment is of great importance in reducing the incidence of serious strictures[3]. This treatment should consist in the slow oral administration of copious amounts of diluted vinegar, grapefruit or lemon, of orange juice, or of 2 per cent acetic acid. This should be followed by 5 cc. of olive oil given orally every thirty minutes for six hours, and every hour for the following twenty-four hours. It is unnecessary to remove the caustic from the stomach by lavage. If liquids can be tolerated, the diet should consist of strained foods and nourishing liquids. Small amounts of olive oil between feedings will relieve some of the symptoms. The diet should be changed to soft, semi-liquid foods as they can be tolerated.

By the fourth day, after the edema and inflammation have subsided somewhat, a soft rubber eyeless catheter[4] filled with mercury or small lead shot should be passed without force into the stomach and allowed to remain in place for two minutes. Unless the esophagus is seen by direct illumination to be undamaged, this procedure should be carried out in every case. If doubt exists, oral burns from the caustic should be considered presumptive evidence of esophageal burns and sufficient indication for early esophageal dilations.

The dilations are repeated daily, the size of the catheter and the period of dilation being increased gradually, until by the tenth day a no. 30-34 French catheter is kept in place five minutes. Following daily dilations for two weeks, the patient is given three dilations a week for two more weeks, then two per week for a month, one a week for a month, two a month for three months, one a month for six months, and two or three a year for several years. If increasing difficulty is encountered with this routine, fluoroscopic study is indicated, and daily dilations may have to be reinstituted.

Early and continued prophylactic dilations are the basis for the success of this therapy. Cooperating social agencies can be of great assistance to the doctor and to the parents of a lye-burned child in fighting the development of strictures. Acquainting the parents and these agencies with the course of the disease and with the necessity for prolonged and continuous therapy is a responsibility of the physician.

3. Salzer, H.: Early Treatment of Corrosive Esophagitis, Wien klin. Wchnschr. 33:307 (April 8) 1920.
4. Bokay catheters may be obtained from the Murray-Baumgartner Surgical Instrument Company, West Chase Street, Baltimore Maryland.

THE SURGICAL MANAGEMENT OF LYE STRICTURES OF THE ESOPHAGUS

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DURHAM

A group of 136 cases of acute lye poisoning in children has recently been reported from Duke Hospital[1]. Ninety-seven of these patients were seen late and already had developing strictures; 25 were seen early following injury, so that measures to prevent stricture could be instituted. Four of these 25 failed to return for dilatations and so developed strictures, and a fifth patient developed a stricture while under treatment. There were thus 102 lye strictures of the esophagus in this series of 136 lye poisonings. Since that report was written, 16 more lye strictures of the esophagus have been seen in Duke Hospital, making a total of 118 strictures of the esophagus requiring treatment.

Nonsurgical Treatment

The treatment of lye stricture of the esophagus is unsatisfactory. When Jackson[2] first drew attention to the strictures which follow lye burns of the esophagus, he pointed out the preventable nature of lye burns. He urged that lye be dispensed in containers

From the Department of Surgery, Duke University School of Medicine, Durham, North Carolina.

1. Kernodle, G. W., Taylor, G. and Davison, W. C.: Lye Poisoning in Children, Am. J. Dis. Child. 75:135-142 (Feb.) 1948.
2. Jackson, C.: Esophageal Stenosis Following the Swallowing of Caustic Alkalis, J.A.M.A. 77:22 (July 2) 1921.

plainly marked "poison," and a campaign was undertaken to educate parents to the dangers of caustic substances. In spite of these efforts, the accidental swallowing of lye by children of the poorer classes continues to be a common occurrence.

It is now generally agreed that the method of treating acute lye burns of the esophagus introduced by Salzer[3] and von Bokay[4] is most likely to prevent the occurrence of subsequent stricture. According to Holt's textbook of pediatrics[5], "the incidence of strictures in the Harriet Lane Home has decreased from approximately 50% to less than 10% of the cases" since the introduction of this method of treatment. This is the method used at Duke Hospital. The report of Kernodle, Taylor and Davison previously referred to adds 9 cases treated by this method to 16 cases previously reported[6].

The treatment of established stricture of the esophagus has been the problem of the Division of Thoracic Surgery and the Nose and Throat Department. For the most part these patients are treated by the formation of a gastrostomy, and retrograde dilatations using a continuous string, after the method of Tucker[7]. There have been 75 patients treated by this method. The best results have been obtained in those who may be discharged after one to two years' treatment. A number of children have been having dilatations for three years, and several have been under treatment as long as five to seven years. It is in this group of patients who do not respond well to retrograde dilatation that major surgical procedures must be undertaken, centering around the resection of the stenosed esophagus.

The Re-Establishment of Continuity of the Esophagus

Because of the location, construction and blood supply of the thoracic esophagus, surgery of this organ has been and still is a hazardous undertaking. All surgery may be divided into two classes. On the one hand are the relatively easy and safe procedures in which a lesion or organ is simply removed. In contrast to this group are the procedures in which the function or continuity of a physiologic or anatomic system must be re-established. The surgical removal of the thoracic esophagus is made difficult by the natural desire to re-establish continuity.

The first successful resection of the thoracic esophagus for carcinoma was reported in 1913 by Torek[8]. The so-called Torek procedure consists in removing the esophagus and creating a proximal esophageal fistula at the base of the neck and a gastrostomy opening in the abdomen. It is the safest procedure, since no attempt is made to re-establish continuity, and it is of value in the treatment of cancer of the esophagus. It can play no part in the treatment of benign lesions, however, where the re-establishment of continuity is the chief aim. Torek's patient wore a rubber tube connecting the esophageal fistula with the gastrostomy opening.

The re-establishment of continuity has been performed both intrathoracically and antethoracically. The formation of a skin-lined tube from the soft tissues of the anterior thorax was first described by Bircher in 1894. Cezar Roux is credited with forming the first antethoracic esophagus using proximal jejunum mobilized on its mesentery. A combination of these two methods, using a portion of jejunum in the lower part and a skin lined tube in the upper portion of the antethoracic esophagus, is the essential feature of the Lexer-Wullstein-Blanel operation. Yudin has reported 80 instances of the construction of an artificial esophagus[9], and feels that the ideal antethoracic esophagus is one entirely composed of jejunum. In 58 of his patients, however, skin-lined tubes of greater or lesser extent formed the upper end of the new esophagus. A number of his cases were strictures due to caustic burns of the esophagus. Colon (Kelling) and stomach (Kirschner) have been mobilized to serve as antethoracic connections with the pharynx or cervical esophagus. Recently Longmire and Ravitch[10] have described the use of tubed skin flaps containing an eventually free graft of jejunum to be transplanted by stages into position as an antethoracic esoph-

3. Salzer, H.: Early Treatment of Corrosive Esophagitis. Wien klin. Wchnschr. 33:307 (April 8) 1920.
4. von Bokay, J.: Ueber die Behandlung der Laugenverätzungen im Kindesalter nach Salzer. Wien klin. Wchnschr. 37:282-285 (Mar. 20) 1924.
5. Holt, L. E. and Howland, J.: Diseases of Infancy and Childhood; revised by L. Emmett Holt, Jr. and Rustin McIntosh, ed. 11. New York: Appleton-Century, p. 409.
6. (a) Martin, J. M., and Arena, J. M.: Lye Poisoning and Stricture of the Esophagus. South. M. J. 32:286-290 (March) 1939. (b) Crowe, J. T.: Poisoning Due to Lye. Am. J. Dis. Child. 68:9-12 (July) 1944.
7. Tucker, G.: Cicatricial Stenosis of the Esophagus with Particular Reference to Treatment by Continuous String, Retrograde Bougienage with the Author's Bougie. Ann. Otol., Rhin., & Laryng. 33:1180-1223 (Dec.) 1924.
8. Torek, F.: The First Successful Case of Resection of the Thoracic Portion of the Esophagus for Carcinoma. Surg., Gynec., & Obst. 16:614-617 (June) 1913.
9. Yudin, S. S.: The Surgical Construction of 80 Cases of Artificial Esophagus. Surg., Gynec., & Obst. 78:561-583 (June) 1944.
10. Longmire, W. P., Jr., and Ravitch, M. M.: A New Method for Constructing an Artificial Esophagus. Ann. Surg. 123: 819-835 (May) 1946.

agus.

Intrathoracic reconstructions have been performed using mobilized segments of jejunum after the principle of Roux. Rienhoff[11] has described important details in the mobilization of the jejunum loop and reported successful cases. Fischer[12] was apparently the first to propose the mobilization of the stomach into the chest and the performance of an intrathoracic esophagogastrostomy. He worked out the procedure in the cadaver, but had no opportunity to carry out the procedure in a patient. His report carried a footnote stating that Starr of Toronto had performed such an operation in a patient, who died on the fifth day from pulmonary embolism. Decker[13] was apparently the first to report the performance of this procedure. His patient died in twenty-eight hours because of persistent atelectasis of the left lung.

Garlock[14], in 1940, described the operation of esophageal resection with esophagogastrostomy for the treatment of carcinoma in the lower three inches of the esophagus. Churchill and Sweet[15], in 1942, reported 9 cases of carcinoma of the lower esophagus or cardiac end of the stomach treated by resection and esophagogastrostomy, with one death. Sweet[16], in 1946, reported 32 esophageal resections with esophagogastrostomy. In 14 of these the anastomosis was performed below the aortic arch; there were 2 deaths in this group. The remaining 18 anastomoses were performed above the aortic arch, with 6 deaths. It should be recognized that all these patients were in the older age group and that mortality figures may be expected to be less in younger people with benign strictures.

Recent Advances in Surgery

The obvious advances in surgery of the esophagus thus recorded are only partially due to the improved skill and technique of the surgeon. The improvement of morbidity and mortality statistics in all branches of surgery during the past ten to fifteen years has been striking. It has been during this period that the recent interest in physiologic surgery has begun to pay dividends. A better understanding of the mechanics and importance of fluid and electrolyte balance, and the ready availability of blood from banks have played a part. Perhaps the greatest advances have been made in the field of anesthesia, where a better understanding of pulmonary physiology, new techniques of administration, and new agents permitting high concentrations of oxygen have liberated the surgeon from the handicap of time and space previously imposed upon him. The possibility of longer operating times makes possible a more meticulous surgical technique. The simple understanding of the importance of a clean tracheobronchial airway has all but eliminated postoperative pneumonia, as postoperative wound infections have been eliminated by the understanding and control of airborne organisms.

A study under way in this hospital to determine the causes of morbidity and mortality following surgical procedures has shown that postoperative complications once common are now rare, and that most complications are now traceable to the advanced stage of the disease treated, and to the effort to extend the range of operability in advanced disease. With the exception of thromboembolic disease, the surgeon has gained control over most postoperative complications not directly related to his technique. With the assurance that meticulous technique without regard for operative time will not endanger the patient, but on the contrary will assure recovery, it is possible to offer radical surgery for benign lesions.

In the past two years we have felt justified in offering, to 3 patients having lye strictures of the esophagus, esophagectomy and intrathoracic esophagogastrostomy after the method most recently described by Sweet. Of these 3 patients 2 were children, in whom anastomosis was performed above the aortic arch. Both are doing well. The third patient was an adult who had anastomosis performed just below the aortic arch.

Case Reports

Case 1

This white boy was referred to Duke Hospital at the age of 2½ years by Dr. S. A. Duncan of Benson. The patient was unable to swallow liquids, having received a lye burn of the esophagus seven weeks previously. A gastrostomy was done, and retrograde dilatations using the Tucker bougies were begun.

11. Rienhoff, W. F., Jr.: Intrathoracic Esophagojejunostomy for Lesions of the Upper Third of the Esophagus, South. M. J. 39:928-940 (Dec.) 1946.
12. Fischer, H.: Esophageal Implantation Into Stomach after Intrathoracic Resection of the Esophagus for Carcinoma, Arch. Surg. 12:241-246 (Jan.) 1926.
13. Decker, H. R.: Report of a Case of Esophagogastrostomy for Carcinoma of the Esophagus, J. Thoracic Surg. 5:143-156 (Dec.) 1935.
14. Garlock, J. H.: The Surgical Treatment of Carcinoma of the Thoracic Esophagus, Surg., Gynec., & Obst. 70:556-569 (Feb.) 1940.
15. Churchill, E. D., and Sweet, R. H.: Transthoracic Resection of Tumors of the Stomach and Esophagus, Ann. Surg. 15: 897-920 (June) 1942.
16. Sweet, R. H.: Carcinoma of the Midthoracic Esophagus, Ann. Surg. 124:653-666 (Oct.) 1946.

He showed very little improvement, requiring dilatations every month for a period of five years. At the end of this time dilatations had become more difficult. It was felt that he should undergo a resection of the strictured esophagus.

Physical examination and laboratory studies were normal. Roentgen examination of the esophagus with barium showed a stricture high in the esophagus starting just behind the aortic arch.

A left thoracotomy was performed under endotracheal cyclopropane and ether anesthesia. The esophagus was resected from above the aortic arch downward, and an esophagogastrostomy was done above and in front of the aortic arch, bringing a large portion of the stomach into the left chest. His postoperative course was complicated by leakage of the suture line, requiring temporary jejunostomy for feeding.

Nine months after operation he is eating what he pleases and has regained the weight lost while in the hospital.

Case 2

A colored boy was first admitted to Duke Hospital at the age of 4 years, five months after having swallowed lye. Preceding this admission he had undergone periodic peroral dilatations, with only very temporary improvement. A gastrostomy was performed at Duke. Retrograde and peroral dilatations proved impossible, and during the next eight years he fed himself by gastrostomy tube, maintaining a satisfactory rate of growth.

Upon his second admission to Duke Hospital, at the age of 12, he was found to be essentially normal on physical examination. Roentgen examination of the esophagus with barium showed a complete stricture at the junction of the cervical and thoracic portions.

A left thoracotomy was performed under endotracheal ethylene and ether anesthesia. The entire thoracic esophagus was resected, and an esophagogastrostomy done at the apex of the thoracic cavity. His postoperative course was uneventful. He now eats anything. Roentgen examination with barium shows a ready flow into the stomach.

Case 3

A 40 year old colored woman was referred to Duke Hospital by Dr. W. D. James of Hamlet. The patient stated that six months before admission she experienced some sort of acute febrile illness associated with profuse and persistent vomiting, the vomitus containing blood. She denied the antecedent ingestion of corrosive liquid, but a history of recurrent acute psychiatric disorders makes this a possibility. When the acute illness subsided, she began to notice progressive difficulty with swallowing. When she was admitted to Duke Hospital she could swallow only liquids.

Physical examination was not remarkable save for evidence of weight loss. Laboratory examination showed a hemoglobin of 12.2 Gm. Total serum proteins were 7 Gm. per 100 cc. Serologic tests for syphilis were negative. Roentgen examination of the esophagus with a barium swallow showed a smooth stricture in the middle third. Esophagoscopy showed a smooth, nonulcerated, concentric stricture at a point 15 cm. below the cricopharyngeal sphincter. Biopsies showed normal epithelium.

She underwent a left thoracotomy under endotracheal ethylene and ether anesthesia. The esophagus below the aortic arch was resected, and an esophagogastrostomy was performed just below the arch, bringing a large portion of the stomach into the left chest. Pathologic examination of the resected esophagus revealed dense hyaline scar with no evidence of malignancy.

When seen three months after operation, the patient had gained 20 pounds in weight. X-ray examination with barium swallow showed ready passage into the stomach.

Squamous cell carcinoma arising in old lye strictures

While an impermeable stricture or one which fails to respond to dilatations is one indication for radical surgery, a second indication is the occurrence of squamous cell carcinoma arising in the scar, much as a Marjolin ulcer arises in old burns of the body

Fig. 1 (Case 5). The roentgenogram on the left shows the complete stricture of the esophagus at the level of the sixth thoracic vertebra. The x-ray on the right shows the anastomotic site just below the superior thoracic inlet.

surfaces. Bockus[17] says, "Occasionally malignancy may be engrafted on an old benign stricture." We have seen 2 such cases of squamous cell carcinoma arising in old lye strictures of the esophagus. Such an occurrence must be rare.

Case 4

A 48 year old white man had swallowed lye as a child and had undergone repeated dilatations. During adult life he had not required dilatations, but always had difficulty in swallowing solid food. During the preceding several months he had noted progressive difficulty with swallowing. Esophagoscopy showed a fungating mass at the level of the aortic constriction, which proved to be carcinoma. A gastrostomy was done.

Case 5

A 22 year old colored man was admitted to Duke Hospital complaining of difficulty in swallowing liquids. At the age of 2 years he had swallowed lye, receiving burns of the mouth and presumably of the esophagus. He received no treatment. He had had difficulty in swallowing solid food since that time, but was able to manage well enough for growth and increase in weight. Six months before coming to the hospital he began to experience increasing difficulty with swallowing, and was very soon reduced to a liquid diet. During this six months' interval he lost 25 pounds in weight.

Physical examination on admission to the hospital showed a somewhat underdeveloped, very poorly nourished colored boy. Laboratory studies showed a hemoglobin of 15 Gm. and total serum proteins of 6.8 Gm. per 100 cc. Roentgen examination of the esophagus with barium showed a smooth, nearly complete, stricture of the esophagus at the level of the sixth thoracic vertebra (fig. 1). Esophagoscopic examination showed the obstructing point to be 7 cm. below the cricopharyngeal sphincter. In this area there was gray, granular tissue which bled easily on trauma. A biopsy was made, and showed squamous cell carcinoma.

The esophagus was resected from above the aortic arch to the stomach, and an esophagogastrostomy was done above and anterior to the arch. Microscopic examination of the resected esophagus showed extensive hyperplasia of the squamous epithelium, with considerable fibrosis and scarring of the underlying connective tissue. In the area of gross tumor the picture of scarring changed to that of neoplasia, with cords and nests of neoplastic epithelial cells invading the subepithelial and muscular layer.

When the patient was discharged on the twelfth postoperative day, he was taking a soft diet well. Three months after operation he has gained 35 pounds in weight.

Summary

The increased safety of surgical procedures makes it reasonable to offer a major intrathoracic operation for the treatment of benign strictures of the esophagus. While it is true that benign strictures of the esophagus need not be resected and may be treated by extrathoracic by-pass procedures, the one stage, intrathoracic procedure described by Fischer, performed by Decker, and most recently advocated by Sweet has been most satisfactory.

17. Bockus, H. L.: Gastroenterology. Philadelphia, W. B. Saunders Co., 1944, v. 1, p. 88.

THUMBNAIL SKETCHES OF EMINENT PHYSICIANS

SIR WILLIAM OSLER

MRS. J. C. TRENT, *Editor*
DURHAM

II

THE WAY OF A TEACHER

Teaching in order to impart regimented understanding is necessary to an extent, at least for the undergraduate, in order for a segment of learning to be presented. Then by an examination the teacher can try to ascertain just how much of this pumped-in wisdom has been retained by the student. If, however, the teacher has not, over and above this order of instruction, an extraordinary *Something* which transcends teaching as we usually know it—an influence which he imparts unconsciously—, he fails to attain greatness. Precepts and ideals abhor labels. They have a way of their own as they emerge from an instructor and enter into the fiber of those in the process of being instructed. They establish not only a way of learning, but a way of living. The textual content of a given subject is soon forgotten. The spirit of the great teacher, his method of approach to problems in his domain of understanding, and the technique which he employs in their solution endure, not only as an inspiration to lighten the pathway of the student, but as a stimulus to high accomplishment.

Such was the influence of Sir William Osler in the medical dispensary, in the wards, and in the rooms of patients. As he visited such areas of distress and maladjustment, he would ask, directly or by suggestion, many questions which were to be answered later by his student attendants at a subsequent ward round, during a visit to a private patient, or incidentally while walking along a hospital corridor. Instruction by him in its higher reaches was not formalized. It was free.

And now a very simple and intimate story must be told of my association over a short period with Dr. Osler. The story illustrates his care and thoughtfulness for many an unknown student. The only requirement was an honest desire on the part of the student to learn. You must visualize a recent medi-

cal graduate who had never travelled beyond the confines of his native state, who had studied and in many areas memorized Osler's "Practice of Medicine," and who had heard of his personality and great diagnostic ability. Furthermore, this would-be student physician knew of Dr. Osler's connection with a new and somewhat different type of hospital at the Johns Hopkins Medical School.

The supposed great difference between this medical school and older institutions in America was to be found in its insistence on a highly scientific approach to an understanding of disease and the employment of this same specialized order in its treatment. The reputation of the hospital was that of a research institution, rather ruthless, demanding accuracy in diagnosis, and allowing abundant time for conjectures as to the nature of the autopsy findings. In this modern teaching institution, bedside instruction had taken the place of amphitheater teaching, and the employment of natural measures to facilitate the healing process, aided by a few chemicals, had supplanted the polypharmacy of many of the older hospitals.

This young medical graduate had written Dr. Osler asking if he might study under him during the summer of 1904. A hearty reply was at once received to this request, and on a day early in June the pilgrimage was commenced. At Baltimore the taxi driver through mistake, and to the good fortune of his passenger, stopped at the gate to the grounds of the hospital rather than at its door. This afforded a fine view of this splendidly balanced building; but feelings of fear were excited by its massive structure, and by the anticipated meeting with the great physician. With a valise in one hand and a heavy bundle of books in the other, an ascent was begun up the steps and over the terraces leading to the centrally located administration building. About halfway up a pause was made, for the load was heavy; and here was found a stone pedestal bearing a sundial on which was this inscription: "One hour alone is in thy hands, the hour on which the shadow stands."

This student has lived with these words for forty-five years. They were not harsh. They were not impelling. They permitted freedom of action in this one hour, but they also implied that real accomplishment might show itself in this period of time. Such was the spirit of the Johns Hopkins Hospital. The teaching of the hospital commenced at the sundial. Inside one found a group of instructors and students who, at some leisure and in good form, studied the sick to learn of the nature of their ailments in an accurate fashion, with the object of rerelating them in a workable form to their environment, whatever that might be. Wisdom and judgment came about through such an order of study.

The sundial episode was refreshing to this traveller. The books were not so heavy and the trepidation was not so great as he approached the front door of the hospital, which when opened exposed in kindly glory the large marble statue of Christ. A sundial, Jesus Christ, and the Johns Hopkins Hospital—how different from this student's preconception of a ruthless spirit of scientific research!

Possibly because I was so obviously lost in the rotunda of the hospital, a lady approached me saying that if I were the young doctor from North Carolina, Dr. Osler was waiting for me in the medical dispensary and had asked her to guide me to him. Think of my emotions on being escorted to so great a physician, who had not only remembered that I was coming to Baltimore, but was looking out for my ease and welfare with consideration. I was greeted as though I were an equal, and after kindly inquiries as to the welfare of Dr. Albert Carr of Durham and Dr. John Whitehead of Salisbury, I was introduced to Doctors Thayer, Futcher, and McCrae as a student-physician from North Carolina who was to help them during the summer in the medical dispensary. What a thrilling experience for the youngster, what a challenge to the best in a human being, what encouragement and what an inspiration to remember in any day of future disappointment! The real teacher was at his best, not through a requirement nor by suggested research, but through a companionship that excited affection, respect, and an abiding yearning to go and do likewise.

With these pleasantries and preliminaries over, I was given a peculiar, wicker, loungelike affair on which the dispensary patients were to rest in considerable discomfort during my physical examinations. Lunch time found us in the hospital dining room. Dr. Welch had joined the gathering. Such was my introduction to the spirit of the place, in which honest study established an equality between those who would learn.

Dr. William Osler, during his connection with the Medical School of the University of Pennsylvania as Professor of Medicine, studying autopsy material at the Philadelphia Hospital (Old Blockley, Philadelphia).

Dr. William Osler as Professor of Medicine and Physician-in-Chief to the Johns Hopkins Hospital. Seated from left to right are Dr. William S. Halsted, Dr. William Osler, and Dr. Howard A. Kelly.

In the dispensary and medical wards Dr. Osler was, by his position, director and chief consultant. Medical problems suitable for clinical research were suggested in the most informal manner. There were no formalized dissertations, but such thoughts served as stimuli which sent his students away from the bedside to the library and the laboratory, but ever back to the patient. Data collected from such sources were not handled as isolated entities of information, but the material was welded together so that the chemical and microscopic became macroscopic, and the real emphasis was placed on the understanding of the patient and his disease as a whole problem in the hippocratic fashion. The charm and stimulating value of such studies were, of course, in large measure due to the personality of the individual who guided them. In addition, the informality and frankness of the discussions served to bring out the best in the students and to develop in them a certain degree of assurance which was but rarely offensive and tended to strengthen their ability to maintain their position when facts were available for them to present their points of view.

Not only were Dr. Osler's co-students given such an order of instruction, but during visitations with the sick he would talk to them in both serious and frivolous vein, not only for the benefit of the patient, but for the general education of both patient and student. And for those patients about to "pass the door of darkness through," words were spoken that eased the way as a release.

During such bedside conversations the names of Hippocrates, Galen, Sydenham, and Linacre became familiar, and the characteristics and practices of such physicians of the past were dwelt upon. He would explain what their approaches to various diseases had been. These ward rounds were full of the history of medicine which excited an appreciation of the past by both student and patient. For example, he would select a patient who had a condition which was first reported by Hippocrates, and would contrast the way Hippocrates would have treated the patient with the way Galen would have treated him. The former would have suggested rest, the use of a certain order of diet, and baths as a part of the medical regimen, while Galen would have insisted on drawing blood, purging, and using a host of artificialities designated as drugs. Hippocrates had a sound concept of the nature of disease. Galen believed in the transitory and ephemeral. Aphorisms like those of Hippocrates were abundant with Osler, such as: "When you think of digitalis, use a bed." Natural measures in the treatment of disease and the healing power of time were given emphasis.

During the summer of 1904, for some reason, Dr. Osler was especially interested in the complications of typhoid fever. The wards furnished numerous cases of this disease, many of the patients having come into the hospital from cargo vessels, well advanced in their illness, often dehydrated and with evidence of renal injury. One such individual, whom the writer was studying in more than routine detail for Dr. Osler, died in a state of anuria. On a Sunday morning in June I found myself alone with this body in the autopsy room, beginning my first autopsy. Having never witnessed one, I had enough forethought to purchase a book on postmortem pathology by Cattell, which gave by word and diagram detailed instructions as to how to conduct such an examination. On Sunday morning it was Dr. Osler's custom to visit certain patients in the Marburg Pavilion of the hospital. On such occasions he was in formal attire, and being by nature handsome, he impressed one as a dignified gentleman and learned physician, never to be forgotten. After leaving the Marburg he went to the ward to ask about his ill patient. Learning of his death and being told that I was doing an autopsy, he came to the morgue to learn the results of my investigation. He found this student-physician reading a book, glancing at the diagrams, and commencing the skin incisions with great care and many misgivings. Imagine my consternation and withering embarrassment when this handsome gentleman in fine Sunday attire walked in to witness my first autopsy!

Osler was ever a student of medicine, essentially a pathologist who, by doing autopsies and studying such tissues both at the Montreal General Hospital and at Blockley in Philadelphia, had learned as much gross pathology as any living man, if not more. He at once commenced an animated discourse on typhoid fever, explaining how it was first differentiated from spotted typhus fever by the celebrated French physician, Louis, describing the pathology of the disease, and emphasizing its complications. These words of wisdom fell upon stony ground as I watched the diagrams in the book and did my best to gain access to the hidden mysteries of this body. Osler remarked about his interest over the years in the typhoid kidney, and then with words of praise for my technique, asked if he might help with the autopsy. The frock coat was thrown across a bench, cuffs taken off, sleeves rolled up, a simple white apron adjusted, and without gloves he proceeded with his usual dexterity to do the autopsy, discuss his findings, and contrast these with similar experiences in the past.

As the autopsy progressed, an hour or more was spent leaning over a sink as he opened the intestinal tract to study the various stages of the initial lesion of typhoid fever and to discourse as enthusiastically about them (for my benefit) as though he had never witnessed them before. This student did not realize he was being instructed; these words were not labeled "instruction," as the information came so freely and unconsciously from the master teacher. We were students together, learning and loving to learn with never a thought of an objective, an examination, a grade. Specific information has to be regimented and labeled in order to be found, but this over-and-above *Something* which a few teachers have defies definition and cannot be regimented. It falls in an area dominated by spirit and gives to a student a way of life more important than specific information.

And now, with the autopsy completed in perfect form, with little remaining for the janitor to accomplish, the invitation came that we have Sunday dinner together, and we did.

From an association with such a teacher
The eye sinks inward and the heart lies plain,
And what we mean, we say, and what we would
we know.
A man becomes aware of his life's flow
And hears its widening murmur and he sees
The meadow where it glides, the sun, the breeze.

WILLIAM DEB. MACNIDER, M.D.
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Oversimplification of health education is a common consequence when the material is presented by those who do not fully understand the complexities of the problems involved. Methods of pedagogy, intriguing as they are to professional educators, are much less important than accuracy of the information disseminated. Material on matters of health prepared by lay writers who hastily "bone up" on a subject is too often viciously misleading because of infantile glamorization, inaccuracy, and excessive simplification. Better no information at all than false concepts. Anatomy, physiology, nutrition, and disease are **not** simple. Making human biology too simple leads to over-confidence, self-diagnosis, and self-medication with disaster as a not infrequent consequence.—Edward J. Stieglitz: A Future for Preventive Medicine, New York, The Commonwealth Fund, 1945, p. 50.

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APRIL, 1949

THE TRENT MEMORIAL ISSUE

At its meeting last July, the editorial board of the NORTH CAROLINA MEDICAL JOURNAL voted to ask each of the three medical schools in the state to prepare one special issue of the JOURNAL every three years, so that one issue a year would be devoted to contributions from alumni and faculty members of one school. Since Dr. Graham of the University of North Carolina School of Medicine and Dr. Harrell of the Bowman Gray School of Medicine were both newly elected to the board last year, Dr. J. C. Trent of Duke consented to be responsible for the first issue.

After Dr. Trent's death last December, the Duke medical faculty agreed to go ahead with the preparation of the issue which he had begun, and to make it a memorial to him. Since Dr. Trent was head of the Division of Thoracic Surgery, it is fitting that all the contributions are concerned with problems relating to the chest. The preparation of this issue has been supervised by Dr. W. C. Sealy, a member of the Division of Thoracic Surgery. The excellence of the material presented speaks well for him and for the Duke Medical School. It is also an appropriate and well deserved tribute to Dr. Trent.

* * *

OUR SESQUICENTENNIAL MEETING

A century and a half ago a state medical society was organized in North Carolina. Apparently the attempt to hold regular annual meetings was abandoned from 1804 to 1849, but from that year until the present there have been only five years when the Medical Society of the State of North Carolina did not hold an annual meeting. Four of these years were during the Civil War—from 1862 to 1865, inclusive. The fifth year without a meeting was 1945, when the federal government forbade all state medical meetings—though allowing political conventions, basketball games and horse races, and labor union meetings on a state or national level.

The sesquicentennial birthday party of the Medical Society of the State of North Carolina, to be held in the Carolina Hotel at Pinehurst, May 9, 10, and 11, should be well attended—not only for sentiment's sake, but because an unusually attractive program has been arranged. At last year's meeting—which was also held in Pinehurst—the registration of doctors, for the first time, passed the 900 mark. Let's make it a thousand this year!

* * *

THE DOCTOR'S RESPONSIBILITY IN THE DIAGNOSIS OF CANCER

Whether for better or for worse, the public has, within the past few years, become more cancer conscious than ever before. Through contributions to the American Cancer Society and other organizations, and through numerous editorials, articles, and even books, people are expressing their concern over the problem of this dread disease. While it is unfortunately true that the majority of patients who are brought to a doctor's office by the publicity campaign of the American Cancer Society are hypochondriacs, it must not be forgotten that *even a hypochondriac can have cancer.*

Whatever his type and whatever his complaint (or complaints), the patient's decision to seek professional advice transfers the responsibility to the doctor. It is up to him to give the patient a careful hearing, a thorough examination, and the benefit of all accessory studies which may be indicated. If cancer is found, the best available treatment should be instituted; if not, the patient should be given the peace of mind made possible by the emphatic assurance that a complete examination has revealed no evidence of a malignant condition.

The public can hardly be expected to do more than it is now doing; the responsibility for the early recognition and treatment of cancer will be increasingly the doctor's.

* * *

"DELAYED ADMISSION TO HOSPITAL"

One of the chief arguments advanced by Mr. Ewing for his tax-supported health insurance plan is the need for better hospital service in this country. In this connection an editorial under the above title in the *British Medical Journal* for March 26 (page 532) is of interest. The editorial begins:

"About a year ago we published an article by Dr. Richard Asher on the dangers of going to bed. It will not be long before we are asked to publish an article on the dangers of not going to bed, if the present difficulties experienced by general practitioners all over the country in securing admission of urgent cases to hospital continue."

One case cited was that of a man with a perforated duodenal ulcer, whose doctor could not get him into a hospital until thirteen hours had elapsed—by which time "he was in a bad condition." The doctor added: "I have been in general practice for 28 years and have never had before July 5, 1948, an experience of this kind."

The editorial records that

"From the time of Queen Elizabeth to July, 1948, the destitute sick were in the privileged position of having beds available for hospital treatment . . . Under the N.H.S. Acts no one below the Minister of Health has the power to require a hospital to admit a sick person. So we have the curious situation in which a privilege enjoyed by the destitute sick since the time of Queen Elizabeth till July 5, 1948, is now not available to them in a universal hospital service open to all."

Thus far, nothing that has been learned from the British experience with National Health Insurance serves to commend it to readers of British medical journals.

THE HIPPOCRATIC OATH IN NEW DRESS

Volume 1, number 1 of the *World Medical Association Bulletin* has just appeared. Its editor-in-chief is Dr. Morris Fishbein; collaborating editors are Dr. Mervin Archdall, Sidney; Dr. Bonnevie, Copenhagen; Dr. Valentin Charry, Paris; Dr. Hugh Clegg, London; Dr. Gigon, Basle; Dr. C. C. Heringa, Amsterdam; Dr. H. E. McDermid, Montreal; Dr. L. G. Tornel, Barcelona; and Dr. John Yui, Shanghai.

The *Bulletin* is published in English, French, and Spanish, the three translations appearing in parallel columns on each page. The leading editorial states that "The primary purpose of the World Medical Association is the raising of standards of medical education through the world and correlated with this the delivery of a high quality of medical service."

One of the most interesting features of this first bulletin is the publication of a modern substitute for the Hippocratic Oath, which was adopted by the World Medical Association at its assembly in Geneva in September, 1948. This oath has already been adopted as an official dedication by the Alpha Omega Alpha fraternity, and by a number of medical colleges and organizations. It is as follows:

"At the time of being admitted as Member of the Medical Profession

"I solemnly pledge myself to consecrate my life to the service of humanity.

"I will give to my teachers the respect and gratitude which is their due;

"I will practice my profession with conscience and dignity;

"The health of my patient will be my first consideration;

"I will respect the secrets which are confided in me;

"I will maintain by all the means in my power, the honor and the noble traditions of the medical profession;

"My colleagues will be my brothers;

"I will not permit considerations of religion, nationality, race, party politics or social standing to intervene between my duty and my patient;

"I will maintain the utmost respect for human life, from the time of conception; even under threat, I will not use my medical knowledge contrary to the laws of humanity.

"I make these promises solemnly, freely and upon my honor."

"APPROACHES TO SOCIAL SECURITY"

Those who naively think that compulsory health insurance paid for by taxes is a recent plan that originated in America should read a little book entitled "Approaches to Social Security: An International Survey," and put out by the International Labour Organisation. The character and purpose of this organization and of the International Labour Conference are explained on the inside of the front cover:

"The International Labour Organisation is an associate of nations, financed by Governments and democratically controlled by representatives of Governments, of management and of labour organisations.

"Its purpose is to promote social justice in all the countries of the world. To this end it collects facts about labour and social conditions, formulates minimum international standards, and supervises their national application."

"The International Labour Conference . . . is a world parliament for labour and social questions. Each national delegation to the annual meetings comprises four delegates, two representing the Government, one representing management, and one representing labour; each of these three sections speaks and votes independently, so that all points of view find full expression."

"The decisions of the Conference are not automatically binding. Governments must submit the Conference standards to their national legislatures. If a legislature accepts a Convention, the Government is bound to apply the Convention and to submit an annual report showing how it is applying it, which is scrutinised by special I.L.O. committees."

The booklet is an honest, factual presentation of the aims of the I.L.O. It leaves no doubt of the frankly socialistic nature of that body. For example, on pages 52 and 53 we are told that

"The opposition of the medical profession to the rational organisation of insurance medical service is likely to be weakened by the gradual narrowing of the field of private practice. It is obvious that in Europe, at all events, the classes on whom the doctors relied to supply their private patients are disappearing . . . In these circumstances the medical profession begins to consider more favourably the idea of a salaried medical service, general in scope . . . The fact is that once the whole employed population, wives and children included, is brought within the scope of compulsory sickness insurance, the great majority of doctors, dentists, nurses, and hospitals find themselves engaged in the insurance medical service, which squeezes out most of the private practice on the one hand, and most of the medical care hitherto given by the public assistance authorities, on the other. The next step to a single national medical service is a short one . . .

"A national medical service is already in operation in New Zealand and in the Soviet Union."

In 1927 — twenty-two years ago — the I.L.O. declared that "The modern State, as a guardian of public health and national prosperity, considers it both a right and a duty to impose compulsion. Even the devotees of individualism admit . . . that insurance is a social duty the performance of which the State may, in the general interest, enforce."[1]

Since the United States, by means of a bill railroaded through Congress in the closing rush, became a member nation of the I.L.O. in 1934, its government is obligated to submit to its "national legislature" recommendations of the International Labour Conference. Our "national legislature," however, is not yet—thank God!—obligated to accept the recommendations of this socialist organization.

1. Shearon, M.: Blueprint for the Nationalization of Medicine, Washington, 1947, p. 7.

* * *

THE PERILS OF PROGNOSIS

Recently the newspapers have given much publicity to a woman whose doctors were said to have told her that she had a heart condition which would prove fatal within a year. The anonymous "Mrs. Heart" was asking for advice on how best to use that year and the money she had accumulated.

Before squandering or giving away her life savings, this woman would do well to read a story in Dr. Norman Vincent Peale's *Guideposts* for April. This tells about the Rev. Anthony Wallock, who "was only twenty when doctors examined his heart. 'You haven't much more than a year to live,' they told him solemnly." Whereupon the condemned man proceeded to live until December 26, 1948, "38 years after doctors had signed his death warrant."

Somehow it is hard to believe that reputable physicians would be so foolish as to tell a patient with heart disease that he, or she, had only a year—or any stated number of years—to live. Most popular writers, however, have the fixed idea that this is a common custom; anyhow, it makes a good story. The writer of the *Guideposts* story is to be commended for not having used the conventional ending that all the doctors who condemned the patient had themselves died long ago.

The flair of the reporter for the sensational is no doubt responsible for the frequency of newspaper articles in which doctors are credited with wild pitches in prognosis. It is rather irksome to the rank and file of medical men to have to read such stories. One possible benefit, however, is that they may make us more careful in the most perilous part of medical practice—that of prognosis.

Clinicopathologic Conference

DUKE UNIVERSITY SCHOOL OF MEDICINE

LELAND D. STODDARD, M.D.
E. E. MENEFEE, JR., M.D.
WILEY D. FORBUS, M.D.

DR. MENEFEE: This 46 year old white woman was first admitted to Duke Hospital on October 31, 1946. The past history and the review of systems were noncontributory. She had been in excellent health until ten weeks prior to admission, when she began to have chills and a fever of 103-104 F. There were no other symptoms. She had been thoroughly studied in two other hospitals, and nothing had been found to account for the chills and fever. She had been treated with penicillin and also had had a course of streptomycin without benefit. The streptomycin had produced a generalized rash and had caused an increase of fever. She had lost 30 pounds in weight.

On admision to this hospital she appeared quite ill. The skin was pale. The lungs were clear; the heart was normal. There was slight tenderness in the epigastric area, but no abdominal masses could be felt. The remainder of the physical examination was normal.

Laboratory studies showed a hemoglobin of 69 per cent, a red blood cell count of 3,650,000, and a white cell count of 8,500, with a normal differential. The sedimentation rate was 56 mm. in an hour. The blood Kahn test was negative, the Weltman coagulation band 0, the serum bilirubin not elevated, the plasma proteins and albumin-globulin ratio normal. Agglutinations for typhoid, paratyphoid, brucella, tularemia, and proteus were all negative. Repeated blood cultures were sterile, and stool cultures failed to show any pathogens. Skin tests for brucella, monilia, blastomyces, and coccidioides were all negative, but skin tests with old tuberculin (1:1000) caused the skin to slough. Examination of the chest by fluoroscopy and films showed a mediastinal mass. The gastrointestinal series and gallbladder series were both normal. Repeated urine examinations and cultures were normal.

While in the hospital the patient ran a Pel-Ebstein type of fever. At this time it was felt that she probably had a lymphoma, but the hypersensitivity to tuberculin raised the question of tuberculosis. For five days, she was given daily roentgen therapy in the small amounts that are usually used for tuberculous adenitis. She was then carefully watched for ten days. At the end of this time there had been no clinical change, and comparative x-rays showed no change in the mediastinal mass. She was then given large doses of radiation, and following this course the mass disappeared, and the patient soon showed definite improvement. She had no further febrile episodes of any significance, and she was discharged on December 23, 1946. The diagnosis was lymphoma, probably Hodgkin's disease.

The second hospital admission was in March, 1947, for a period of ten days. She stated that she had had some discomfort beneath the sternum, about six inches below the site of the original mass, and also some pain in the right upper quadrant of the abdomen. Lymph nodes in the cervical region had become enlarged and then had disappeared spontaneously.

Physical examination was essentially normal. She had gained 5 pounds and in general looked better. Laboratory findings were as follows: hemoglobin 80 per cent, red blood cell count 4,750,000, white blood cell count 8,250, with a normal differential except for 14 per cent monocytes. Again all agglutination tests were negative. Plasma proteins were normal, but the albumin-globulin ratio was 1. Roentgenograms of the chest failed to reveal any masses. Barium studies showed indentation of the esophagus, suggesting pressure by nodes. She was given roentgen therapy totaling 1250 r over this region.

She was admitted to the hospital for the third time on July 20, 1947. Since the March visit she had lost six pounds and had had frequent elevations of temperature, but never over 100 F. One month prior to this admission she had suddenly noticed a change in her voice, and two weeks later she had experienced difficulty in swallowing.

Physical examination was again normal, except for total paralysis of the right vocal cord. She did not appear ill. No lymph nodes were palpable, and the thyroid was not enlarged. The breasts, the heart, and the lungs were normal. No abdominal masses could be felt. Hematologic studies revealed the hemoglobin to be 71 per cent, the red blood cell count 4,000,000, and the white blood cell count 8,100, with a normal differential. The urine was normal. A complete gastrointes-

tinal series was entirely normal.

Review of the case at this time cast doubt on the diagnosis of lymphoma. There had been no recurrence of masses, and the only peripheral nodes that had ever appeared had disappeared spontaneously. Despite the absence of clinical findings, however, the patient had lost ground. It was felt that her case had not followed the usual course of malignant lymphoma, and the question of tuberculosis was raised again. She was found to give a 4-plus reaction to 0.1 cc. of a 1:1,000,000 solution of old tuberculin given intradermally. Nothing else to substantiate a diagnosis of tuberculosis could be found, but after much consideration it was decided to change the working diagnosis to lymphatic tuberculosis.

It was felt that the extreme sensitivity to tuberculoprotein might cause necrosis and extension of existing lesions, and be detrimental to healing; hence an attempt was made to desensitize her to old tuberculin. Injections of a 1:1,000,000,000 solution were begun, and the dose was gradually increased until dilutions of 1:1,000,000 were being given. At this point she was started on 1 Gm. of streptomycin daily, and discharged to continue the therapy for two months at home.

She seemed to improve a great deal on this therapy; she gained weight, and was completely afebrile. During the late fall of 1947 she was able to resume her usual activities. However, late in December, 1947, she began to have severe substernal pain which required the use of Demerol about every six hours.

She returned to Duke Hospital in January, 1948. At this time she looked better than at any other visit. Physical examination, however, showed tenderness to fist percussion over the upper thoracic spine; the liver was now palpable and firm 2 cm. below the costal margin; and the vocal cord paralysis had persisted. All roentgenograms were normal except for those of the spine, which showed a complete collapse of the fourth thoracic vertebra. In view of this change it was felt that she must have had a malignancy, and further roentgen therapy was advised.

She went home for a week. During this time, she began to have fever and pain in both sides of her chest, and she was quite ill when she returned for her fifth admission. The physical findings had not changed. The hemoglobin was 65 per cent, the white blood cell count 9,100, and the differential normal. A skin test with old tuberculin (1:1,000,000) was now negative. Needle biopsy of the collapsed vertebral body showed no neoplastic cells. Pelvic examination was normal. A gallbladder series was normal. A gastrointestinal series showed diverticula of the esophagus, but nothing else of significance.

During the first week of hospitalization the patient's temperature rose to 102 F. every day. She received roentgen therapy over the spine and obtained considerable symptomatic relief from pain, but she continued to have substernal discomfort. During the second week she improved and was afebrile. She was discharged on February 7, 1948, somewhat improved, with a diagnosis of malignancy, type and primary site unknown.

At home she did fairly well but continued to have slight temperature elevations until May, 1948, when her temperature began to go higher, reaching 103 F. Concurrently, she developed severe pain in the cervical, midthoracic, and lower lumbar spine. She was again started on streptomycin and received it for seven weeks but, this time, without effect.

On her final admission (July 15, 1948) she appeared acutely and critically ill. The skin was quite pale and moist. No nodes could be felt, and the heart was normal. The right diaphragm was markedly elevated, but the lungs were clear. The abdomen was markedly distended, hard, and tympanitic. No masses were felt. The hemoglobin was 40 per cent, the red blood cell count 3,000,000, the white blood cell count 27,500, with 84 per cent segmented polymorphonuclears, 5 per cent stab cells, 9 per cent monocytes, and 2 per cent lymphocytes. The urine showed a trace of albumin. The nonprotein nitrogen was 52 mg. per 100 cc.; the van den Bergh test gave a direct reaction, with 1.1 mg. of bilirubin per 100 cc.; and the total proteins were 6.1 Gm. per 100 cc.

The patient was so ill that only bedside films could be obtained. These were thought to show a markedly elevated right diaphragm, with a large gas bubble in the colon. Her temperature ranged from 96 to 103 F. She went steadily downhill, and expired on July 25, 1948.

It was our final clinical impression that this patient had carcinomatosis, primary site undetermined. We expected to find at

autopsy neoplasm throughout the peritoneal cavity, in the lymph nodes of the mediastinum with metastases causing right recurrent laryngeal paralysis and right phrenic paralysis, and metastases to several vertebrae. We had never seen tuberculosis produce permanent recurrent laryngeal paralysis, cause destruction of a vertebral body without extension to adjacent bodies, nor behave in general as this case had. On the other hand, the course of her disease was certainly not that of a malignant lymphoma. It did seem to fit with carcinoma perhaps better than with any other disease.

Pathologic Findings and Discussion

DR. STODDARD AND DR. FORBUS

The complicated clinical course reflects numerous lesions resulting from a granulomatous inflammatory reaction or from subsequent complications. The pathologic process is very largely understandable from the gross findings.

About the trachea and bronchi were a number of scarred lymph nodes with caseous centers. Similar caseous nodes measuring as much as 2 or 3 cm. were present at the porta hepatis, about the head of the pancreas, and along the lesser curvature of the stomach. Mesenteric and other abdominal nodes were grossly normal. The inflammatory reaction had extended from two of the mediastinal nodes to involve the wall of the esophagus, and during the course of healing and fibrosis, two characteristic esophageal traction diverticula were produced.

Much the same course of events was repeated around the pylorus and prepyloric region of the stomach, where a puckered traction diverticulum was related to an adjacent lymph node. A more destructive inflammatory reaction, however, developed from another node, completely eroded the stomach wall, and produced a fistula connecting the stomach with what became an abscess cavity, as shown in figure 1. The abscess was contained by the scarred capsule of the adjacent, excavated lymph node, by the liver superiorly, by the porta hepatis laterally, and by the head of the pancreas posteriorly. About the abscess wall was considerable scarring, which involved major branches of the portal vein leading to the right lobe of the liver. The distal portion of the portal vein and its tributaries—splenic, superior and inferior mesenteric veins—were without lesions.

Microscopic examination of sections from this area confirmed the extensive scarring. Amid the scar tissue were a number of lymph nodes which were almost completely destroyed by central caseous necrosis surrounded by a granulomatous inflammatory reaction of lymphocytes, plasma cells, foreign body-type giant cells, and epithelioid cells which seldom formed tubercles. Similar granulomatous reaction was found within the abscess wall, but nearer the cavity proper a more nondescript chronic inflammation was present. The neighboring branches of the right portal vein were the seat of an extensive, thrombosing pylephlebitis.

Returning to the gross examination, it was found that these intrahepatic portal veins formed a honeycomb connecting the abscess at the porta hepatis with the large multiloculated abscess in the right lobe of the liver. In microscopic sections, the walls of the veins were hardly recognizable because of an organizing phlebitis, and their lumina were filled with a suppurative exudate containing great numbers of cocci and bacteria, but no acid-fast organisms. A similar inflammatory reaction was found in the large multiloculated liver abscess, which at autopsy contained a large quantity of purulent, necrotic material. Hemolytic staphylococci, anaerobic streptococci, and Escherichia coli were found in cultures from the abscess; tubercle bacilli and fungi did not grow in specific culture media; amebae were not seen in fresh preparations.

We consider the original granulomatous lymphadenitis to be responsible for establishing the gastric fistula, but when gastrointestinal flora gained access to the cavity at the porta hepatis, an ordinary pyogenic abscess developed in the right lobe of the liver *via* the portal veins. It was possible, of course, for gas from the gastrointestinal tract to enter this large cavity, and this accounted for the roentgenographic picture of a gas-containing cavity beneath the elevated right leaf of the diaphragm.

The fourth thoracic vertebra was collapsed as the result of an old destructive lesion involving its body and an adjacent intervertebral disc. A shaggy periosteal exudate and some new bone formation were present. The adjoining vertebral bodies were unaltered except for a continuation of the periostitis and underlying erosion of their cortices. Microscopically, the marrow spaces of the

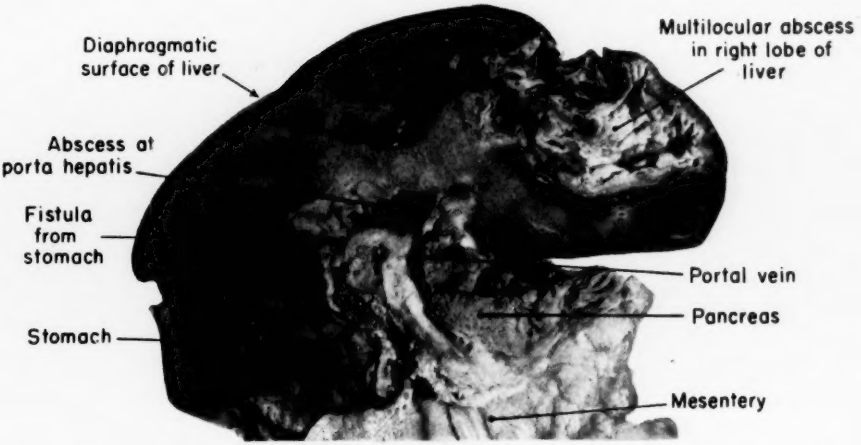

Fig. 1. Posterior view of the cut surface of the liver, showing a fistula leading from the stomach to an abscess near the porta hepatis. The adjacent enlarged lymph nodes are caseous. Scarring is conspicuous about portal vein branches leading to a large abscess in the right lobe of the liver.

collapsed vertebra were filled by a loose granulation tissue infiltrated with a few plasma cells and lymphocytes. Bony trabeculae were not destroyed, but there was actually some new bone formation. The periosteal inflammatory reaction was quite extensive, chronic, and not strictly tuberculoid in type. One intervertebral cartilage was thin in places, but in other places it had proliferated as part of the healing reaction. No active or caseous lesion was present.

In general, then, the granulomatous inflammation was characterized by caseous necrosis in many sites, particularly the nodes. Nowhere, however, was there an exceptionally active, progressive extension of the lesions or even well-marked tubercle formation. In most places hyalinization and scarring were conspicuous; repair and bone formation in the vertebra were remarkable.

In acid-fast stains of tissue sections and of smears, tubercle bacilli were not found in either scarred or caseous areas. Unfortunately, only the liver abscess was specifically cultured for tubercle bacilli. Other possible etiologic agents such as fungi were not seen in the sections; no doubly-refractile material was seen with polarized light. Despite failure to demonstrate the organism, we think that the remarkably positive tuberculin test, the course of the disease, and the anatomic findings are most consistent with tuberculosis. Clinical observations, correlated with the lesions described, indicate that this is what probably happened:

The oldest lesion, which we have not previously mentioned, was an almost completely hyalinized and healed peripheral focus beneath the pleura of the right upper lobe. From this site there was lymphatic spread to the hilar nodes (which comprised the mass originally treated by irradiation) and subsequently to other lymph nodes. There was no unequivocal evidence of hematogenous dissemination of tubercle bacilli which usually occurs at this time, for we found none of the ordinary miliary tubercles or peculiar tubercles described in streptomycin-treated cases[1].

As the inflammatory reaction extended from the mediastinal nodes and was followed by healing, the esophageal diverticula, and possibly recurrent laryngeal nerve involvement were produced. Next appeared excruciating mediastinal pain associated with collapse of the fourth thoracic vertebra. Tuberculous osteomyelitis of the spinal column often begins from blood-borne medullary foci, but in this case the extensive periostitis involving adjacent vertebrae may indicate local extension from contiguous paraesophageal lymph nodes.

1. Flory, C. M., and others: Modification of Tuberculous Lesions in Patients Treated with Streptomycin, Am. Rev. Tubere. 58:421-118 (Oct.) 1948.

The final clinical episode was related to the complicated situation culminating in the hepatic abscess. Had this last chance complication not intervened, the course of the disease might have been greatly extended, for healing of lesions everywhere was the rule. At the same time, however, the patient's hypersensitivity was sufficient to account for caseous necrosis in the presence of, we suppose, only a few organisms.

It is not profitable at this time to discuss the possible effects of antibiotic therapy on the lesions, because roentgen therapy and efforts at desensitization confuse an already complicated situation. The histologic reaction and fibrosis resemble in certain details the reported anatomic effects of streptomycin[1,2].

Anatomic Diagnoses

Focal pulmonary scarring (healed tuberculosis); granulomatous inflammatory reaction with caseous necrosis and fibrosis of hilar, mediastinal, porta hepatic, and parapancreatic lymph nodes; traction diverticula of esophagus and stomach; peritoneal abscess at porta hepatis with fistula from stomach diverticulum; pylephlebitis; multilocular abscesses of right lobe of liver; granulomatous inflammatory destruction of fourth thoracic vertebra (old tuberculosis); portal inflammation and early fibrosis of liver (early biliary cirrhosis); congestive splenomegaly. Bilateral lobular pneumonia. Fibrous pleural adhesions.

2. Auerbach, O., and Stemmermann, G. N.: Anatomic Change in Tuberculosis Following Streptomycin Therapy. Am. Rev. Tuberc. 58:149-162 (Oct.) 1948.

Schering Appoints New Southern Field Representatives

Schering Corporation of Bloomfield and Union, New Jersey, manufacturers of endocrine and pharmaceutical preparations for the medical profession, announces the appointment of five new representatives to the Southern Division of the Schering Professional Service staff. The two who will serve North Carolina are Mr. John A. Bookhout, whose headquarters will be in Charlotte, and Mr. William E. Davis, who will be located in Greensboro.

The appointment of Dr. Geoffrey W. Rake as Director of the Squibb Institute for Medical Research was announced recently by Carleton H. Palmer, Chairman of the Board of E. R. Squibb & Sons.

Dr. Rake is assuming the duties of Director of the Institute following the resignation of Dr. James A. Shannon, who will shortly take up his duties as Associate Director in charge of research, National Heart Institute.

Committees and Organizations

CANCER COMMITTEE*

CANCER CONTROL IN NORTH CAROLINA

During the past year North Carolina has made momentous strides in the control of cancer. The Division of Cancer Control of the North Carolina State Board of Health has been most active. The long range program of cancer control in North Carolina is at last becoming a reality. Dr. Ivan Procter is director of the Division, and has as his assistant Dr. Mildred Schram, Ph.D., formerly of the Donner Foundation of Philadelphia.

Many will remember the time when tuberculosis was the leading cause of death in North Carolina. The story of the control of tuberculosis is familiar to everyone. It was accomplished through education, research, and service. The same plan has been adopted to control cancer, the number 2 killer. The control of cancer depends upon the early diagnosis of the disease. That the educational program of the American Cancer Society is being felt cannot be denied. The program has made the laity cancer conscious—perhaps, in some instances, too much so. The program has attempted to teach the mass of people the early signs of cancer—the seven danger signals—and to consult their physician at the first appearance of any of these signs. It has told them that only physicians are qualified to treat cancer, that there are only three accepted methods of treatment—surgery, x-ray, and radium—and that the ability to cure cancer depends on early diagnosis.

As a result of this program of education more and more people are consulting physicians for periodic health examinations and at the first appearance of one of the seven danger signals. Physicians must not allow this program of education to get ahead of them. When these individuals present themselves for a periodic health examination or with one of the seven danger signals, they

*Members of the Cancer Committee are Drs. T. Leslie Lee, Chairman, Kinston; L. P. Williams, Edenton; H. B. Ivey, Goldsboro; Ivan M. Procter, Raleigh; Robert P. Morehead, Winston-Salem; Edward McG. Hedgpeth, Chapel Hill; Hugh A. McAllister, Lumberton; A. M. Oelrich, Sanford; B. W. McKenzie, Salisbury; Monroe T. Gilmour, Charlotte; Forrest M. Houser, Cherryville; and E. W. Schoenheit, Asheville.

deserve to be, and must be, *examined.* All physicians in every field of medicine must alert themselves and must be able, after using the latest and best methods of diagnosis, to assure the individual, in so far as possible, that he has or does not have cancer. This will cure many cases of cancerphobia. Further advice should be given as to future examinations. No longer can a physician tell a female patient with irregular vaginal bleeding that her condition is due to the menopause, without doing a bimanual or speculum examination. The public will no longer accept this sort of treatment. That physician is jeopardizing his patient's life.

During the past year six clinics for the detection and diagnosis of cancer have been established by the Division of Cancer Control of the State Board of Health. It is hoped in the near future to establish many more detection centers throughout the state. These detection and diagnostic centers have met with the enthusiastic approval of both the profession and the laity in the areas in which they are located. Letters received from grateful individuals attending these clinics seem to indicate that these clinics are a means of improving our public relations. The clinics and other services rendered by the American Cancer Society are our service in the control of cancer.

Untold millions of dollars are being spent by the American Cancer Society, the United States Public Health Service, foundations, and individuals in a search for the cause and cure of cancer. Much has been accomplished by research. Much has been learned of the biologic, metabolic, chemical, and physical properties of cells. As yet the etiologic agent is unknown, but the search will go on. Let us hope that in the not too distant future the cause and even the cure of cancer will be discovered.

Important messages are presented in the advertisements in our journal each month. New products are announced from time to time and information is presented regarding the use of products featured. Other types of ads emphasize services rendered and commodities offered that may be used in your practice, in your office, and in your home. Doctor, you can rely on the statements and facts presented. We intend to include only ethical advertisements in our journal. Please tell the advertisers that you saw their ads in the **North Carolina Medical Journal.**

BULLETIN BOARD

Ninety-Fifth Annual Session
The Medical Society
of the State of North Carolina

SESQUICENTENNIAL CELEBRATION

One Hundred and Fifty Years of Medical Progress in North Carolina

May 9, 10 and 11
1949

PINEHURST, NORTH CAROLINA
Headquarters—Hotel Carolina

REGISTER PROMPTLY

Members of the State Medical Society, of the Auxiliary, and all visitors are requested to register promptly at the Registration Desk in the Lobby of The Carolina. Please present membership card when you register.

Registrations in charge of—

Miss Anne Williams	Red Springs
Miss Catherine Johnson	Winston-Salem
Mrs. Grady Covington	McCain
Miss Lema Crissman	Raleigh

OFFICIAL CALL

According to the By-Laws, as amended at the 1940 Session, the House of Delegates will convene at Pinehurst, North Carolina, in the Ballroom of the Carolina Hotel, Monday afternoon, May 9, 1949, at 2:00 o'clock.

James F. Robertson, M.D., President.

Attest:
Roscoe D. McMillan, M.D., Secretary-Treasurer.

ANNOUNCEMENT

A series of valuable prizes is being offered for attendance of physicians at the exhibit area located on the west porches of the Headquarters Hotel.

Each physician will have received a "punch ticket" at General Registration Desk containing a serial number which, when **punched out** by each technical exhibitor will entitle him to a chance at the first award, then second award, etc., at a public drawing to be held Wednesday, May 11, at 11:55 A. M. Holder of ticket must be present to win.

James T. Barnes
Executive Secretary.

ENTERTAINMENT

Annual Golf Tournament.

18 holes Blind Bogy.

Your handicap must be turned in at Country Club desk before starting play.

W. A. Brewton, M.D., Chairman of Tournament, Enka.

Frank P. Powers, M.D., Co-Chairman, Raleigh

Prizes

1. For winning score between 70 and 80, including handicap.
2. Prizes for low net 18 holes and low net 36 holes.
3. Prizes for low gross 18 holes and 36 holes.
4. Prizes awarded Wednesday morning at Second General Session.

RESUME OF PROGRAM

SUNDAY, MAY 8, 1949

3:00 P.M.—Executive Committee Meeting (Small Card Room)

MONDAY, MAY 9, 1949

9:00 A.M.—Registration Booth Opens
2:00 P.M.—House of Delegates of Medical Society (Ballroom)
5:30 P.M.—Intermission, House of Delegates of Medical Society
6:00 P.M.—Medical College of Virginia Alumni Dinner (Crystal Room)
8:00 P.M.—House of Delegates Reconvenes
8:30 P.M.—Bingo Party, Auxiliary to Medical Society (Pine Room)

TUESDAY, MAY 10, 1949

7:30 A.M.—Officers' Breakfast (Crystal Room)
8:00 A.M.—Registration Booth Opens
9:00 A.M.—First General Session of Medical Society (Ballroom)
9:00 A.M.—Executive Board Meeting, Auxiliary to Medical Society (Pine Room)
10:30 A.M.—Annual Meeting, Auxiliary to Medical Society (Pine Room)
11:00 A.M.—Medical Advisory Committee to the North Carolina Commission for the Blind (Dutch Room)
1:00 P.M.—Luncheon, Auxiliary to Medical Society (Pinehurst Country Club)
University of Pennsylvania Alumni Luncheon (Crystal Room)
Jefferson Medical College Alumni Luncheon (East End of Dining Room)
Tulane Medical College Alumni Luncheon (Stag Room)
2:30 P.M.—Section Meetings, Medical Society:
Section on General Practice of Medicine and Surgery (Ballroom)
Section on Pediatrics (Large Card Room)
Section on Ophthalmology and Otolaryngology (Theater)
Section on Radiology (Community Church)
Section on Public Health and Education (Pine Room)
2:30 P.M.—Professional Sound Motion Pictures — The Early Diagnosis of Cancer—Division of Cancer Control, State Board of Health, Cancer Committee of the State Medical Society, and the North Carolina Division—American Cancer Society (Dutch Room)
4:00 P.M.—Tea, Auxiliary to Medical Society (West Parlor)
7:00 P.M.—President's Dinner (Main Dining Room)

WEDNESDAY, MAY 11, 1949

8:00 A.M.—Registration Booth Opens
9:00 A.M.—Second General Session of Medical Society (Ballroom)
10:00 A.M.—Bridge Party, Auxiliary to Medical Society (Large Card Room)
11:50 A.M.—Election of two members of State Board of Health
11:55 A.M.—Awarding of Prizes
12:00 Noon—Conjoint Session (Ballroom)
1:00 P.M.—Wake Forest Alumni Luncheon (East End of Dining Room)
Duke University Medical Alumni Luncheon (Stag Room)
University of North Carolina Medical Alumni Luncheon (Crystal Room)
2:30 P.M.—Second Meeting of House of Delegates (Small Card Room)
2:30 P.M.—Section Meetings, Medical Society:
Section on Surgery (Large Card Room)
Section on Practice of Medicine (Ballroom)
Section on Gynecology and Obstetrics (Pine Room)
Section on Neurology and Psychiatry (Community Church)
Section on Pathology (Theater)
2:30 P.M.—Professional Sound Motion Pictures—The Early Diagnosis of Cancer—Division of Cancer Control, State Board of Health, Cancer Committee of the State Medical Society, and the North Carolina Division—American Cancer Society (Dutch Room)
5:00 P.M.—Third General Session (Ballroom)

PROGRAM OF THE MEDICAL SOCIETY

SUNDAY, MAY 8, 1949

3:00 P.M.—Executive Committee Meeting (Small Card Room)

MONDAY, MAY 9, 1949

9:00 A.M.—Registration Booth Opens
2:00 P.M.—First Meeting of House of Delegates (Ballroom)
Invocation—
Intermission, 5:30 P.M. to 8:00 P.M.
6:00 P.M.—Medical College of Virginia Alumni Dinner (Crystal Room)
8:00 P.M.—House of Delegates Reconvenes (Ballroom)

TUESDAY, MAY 10, 1949

7:30 A.M.—Officers' Breakfast (Crystal Room)

SYMPOSIUM

The Job of the County and the District Medical Societies—Joseph S. Hiatt, Jr., M.D., McCain, Moderator

8:00 A.M.—1. The County and the District Medical Societies—Their Part in Medical Organization—Alban Papineau, M.D., Plymouth
- (a) Relation to the State Medical Society
- (b) Relation to the American Medical Association
- (c) Relation to Other Medical Organizations—such as N. P. C., Blue Cross, Academy of General Practice, etc.

8:20 A.M.—2. The County and the District Medical Societies—Their Responsibility to the Membership—Milton S. Clark, M.D., Goldsboro
- (a) Organization Responsibilities
  1. Membership—Selection and Maintenance
  2. Censorship — Maintaining Ethics
  3. Hospital Relations
- (b) Scientific Program
- (c) Fellowship and Business
  1. Social Functions — Golf, Bowling, Parties
  2. Business Aids — Credit and Collection, Telephone Answering Service, etc.

8:40 A.M.—3. The County and the District Medical Societies—Their Responsibility to the Public—Allyn B. Choate, M.D., Charlotte
- (a) Medical Care — Serving the Public
- (b) Community Agencies
- (c) Newspapers, Radio, Industry, and Labor
- (d) Legislative - Political Responsibilities of the County Medical Societies

9:00 A.M.—Adjournment
8:00 A.M.—Registration Booth Opens

FIRST GENERAL SESSION

(Ballroom)

TUESDAY, MAY 10, 1949

9:00 A.M.—Call to Order, Roscoe D. McMillan, M.D., Chairman Committee on Arrangements
Invocation
Announcements
Presentation of President James F. Robertson, M.D.

9:10 A.M.—Report of Committee on Award of Moore County Medal:
David R. Murchison, M.D., Chairman, Wilmington
R. Beverly Raney, M.D., Durham
Edward W. Phifer, M.D., Morganton

9:20 A.M.—Report of Obituary Committee:
Robert M. McMillan, M.D., Chairman, Southern Pines
Herbert N. Ogburn, M.D., Greensboro
Heyward C. Thompson, M.D., Shelby

9:30 A.M.—Circulatory Changes in Hyperthyroidism—Eugene A. Stead, Jr., M.D., Professor of Medicine, Duke University School of Medicine, Durham (From Section on General Practice of Medicine and Surgery)

9:50 A.M.—The Management of Vomiting in Acute Infections Without the Use of Parenteral Fluids—A. H. Pate, M.D., Goldsboro (From Section on Pediatrics)

10:10 A.M.—Errors in Medical Education and the Remedy—R. B. Davis, M.D., Greensboro

10:30 A.M.—Cancer of the Breast — Samuel F. Marshall, M.D. (by invitation), Cosponsored by North Carolina Division of American Cancer Society, Lahey Clinic, Boston, Mass.

11:10 A.M.—Bilateral Recurrent Laryngeal Nerve Paralysis following Thyroidectomy —V. K. Hart, M.D., Charlotte (From Section on Ophthalmology and Otolaryngology)

11:30 A.M.—The Roentgen Aspect of Non-opague Pulmonary Foreign Bodies—George J. Baylin, M.D., Department of Radiology, Duke University, Medical School and Hospital, Durham (From Section on Radiology)

11:50 A.M.—Nursing for the Future—Miss Ruth W. Hay, Professor of Public Health Nursing, University of North Carolina, Chapel Hill

12:10 P.M.—Recent Advances in the Treatment of Neurosyphilis — Augustus S. Rose, M.D. (by invitation), Boston, Mass. (From Section on Neurology and Psychiatry)

12:30 P.M.—Problems in Medical Legal Investigation in North Carolina — Wiley B. Forbus, M.D., Duke University School of Medicine, Durham (From Section on Pathology)

12:50 P.M.—Adjournment

ALUMNI LUNCHEONS

TUESDAY, MAY 10, 1:00 P.M.

University of Pennsylvania—W. Raney Stanford, M.D., President, Durham
(Crystal Room)

Jefferson Medical College—H. H. Bradshaw, M.D., President, Winston-Salem
(East End of Dining Room)

Tulane Medical College—W. M. Long, M.D., President, Mocksville
(Stag Room)

TUESDAY MAY 10, 2:30 P.M.

(Dutch Room)

Professional Sound Motion Pictures—The Early Diagnosis of Cancer—Division of Cancer Control, State Board of Health, Cancer Committee of the State Medical Society, and the North Carolina Division—American Cancer Society

SECTION ON GENERAL PRACTICE OF MEDICINE AND SURGERY

(Ballroom)

Tuesday, May 10, 2:30 P.M.

Amos N. Johnson, M.D., Garland, Chairman

The Diagnosis and Management of Jaundice in General Practice.
William H. Flythe, M.D., High Point

Laboratory Methods in General Practice.
Weston M. Kelsey, M.D., Department of Pediatrics, Bowman Gray School of Medicine, Winston-Salem.

Some Neurologic and Vascular Complications of Diabetes Mellitus.
William M. Nicholson, M.D., Department of Medicine, Duke University School of Medicine, Durham.

The Dangers of Obscuring Serious Disease by Early Treatment of Mild Symptoms.
George T. Harrell, Jr., M.D., Professor of Medicine, Bowman Gray School of Medicine, Winston-Salem.

Allergy in General Practice.
Milton S. Clark, M.D., Goldsboro.

Circulatory Changes in Hyperthyroidism.
Eugene A. Stead, Jr., Professor of Medicine, Duke University School of Medicine, Durham.
(Before First General Session, Tuesday, May 10.)

SECTION ON PEDIATRICS

(Large Card Room)

Tuesday, May 10, 2:30 P.M.

J. Robert Adams, M.D., Charlotte, Chairman

Spinal Subarachnoid — Ureteral Anastomosis for Communicating Congenital Hydrocephalus. Lantern Slides and Motion Picture.
Barnes Woodhall, M.D., Durham.

The Therapy of Certain Types of Epilepsy.
R. L. Masland, M.D., and W. S. Lockhardt, M.D., Winston-Salem.

The Psychosomatic Approach in Pediatrics.
Frank Howard Richardson, M.D., Asheville.

The Management of Vomiting in Acute Infections Without the Use of Parenteral Fluids.
A. H. Pate, M.D., Goldsboro (Before First General Session, Tuesday, May 10).

Drug Therapy for Asthmatic Children.
Susan C. Dees, M.D., Durham.

Acrodynia—Case Reports and Discussion of Etiology and Treatment.
C. G. Watkins, M.D., Charlotte.

SECTION ON OPHTHALMOLOGY AND OTOLARYNGOLOGY

(Theater)

Tuesday, May 10, 2:30 P.M .

L. R. Hedgepeth, M.D., Lumberton, Chairman

Bilateral Recurrent Laryngeal Nerve Paralysis Following Thyroidectomy. Motion Picture.
V. K. Hart, M.D., Charlotte (Before First General Session, Tuesday, May 10).

Spindle Cell Sarcoma of Choroid. Report of a Case.
Elbert Anderson, M.D., Wilmington.

Malignant Melanoma of the Nasal Cavity.
William B. Alsup, M.D., Winston-Salem.

Recent Advances in Cataract Surgery. Colored Film.
H. H. Briggs, M.D., Asheville.

Treatment of Tuberculosis of the Larynx with Streptomycin.
E. J. Chapman, M.D., Asheville.

The Use of Beta Rays in External Diseases of the Eye.
F. W. Stocker, M.D., and S. D. McPherson, Jr., M.D., Durham.

SECTION ON RADIOLOGY

(Community Church)

Tuesday, May 10, 2:30 P.M.

Henry B. Ivey, M.D., Goldsboro, Chairman

Gastric Malignancy: A Correlation of Present Clinical and Roentgenologic and Gastroscopic Findings with Prognosis.
W. W. Vaughan, M.D., Radiologist, Watts Hospital, Durham.

The Roentgen Aspect of Non-opague Pulmonary Foreign Bodies.
George J. Baylin, M.D., Department of Radiology, Duke Hospital and Medical School, Durham. (Before First General Session, Tuesday, May 10).

Reading Difficult and Unusual Films by Members.

SECTION ON PUBLIC HEALTH AND EDUCATION

(Pine Room)

Tuesday, May 10, 2:30 P.M.

E. H. Ellinwood, M.D., Newton, Chairman

Public Health and the Medical Care Program.
E. G. McGavran, M.D., Dean, School of Public Health, University of North Carolina, Chapel Hill (Before Second General Session, Wednesday, May 11).

Report on the Activities of the North Carolina Cancer Program.
Ivan Proctor, M.D., Director, Division of Cancer Control, State Board of Health, Raleigh.

Present Trends in the Treatment of Syphilis.
Harold G. Magnuson, M.D., Director, Syphilis Experimental Laboratory, School of Public Health, Chapel Hill.

The Problems of Adequate Training for Public Health Personnel to Meet Today's Needs.
Wm. P. Richardson, M.D., Director, Department of Field Training, School of Public Health, Chapel Hill.

1799-SESQUICENTENNIAL CELEBRATION-1949

(Main Dining Room)

(Dress optional)

Tuesday, May 10, 1949

7:00 P.M.—Banquet.
Toastmaster—Sam F. Ravenel, M.D., Greensboro.
Invocation—Wingate M. Johnson, M.D., Winston-Salem.

7:40 P.M.—Presentation of Guests.

7:50 P.M.—Address—James F. Robertson, M.D., President of the Medical Society of the State of North Carolina.

8:10 P.M.—Presentation of President's Jewel to the Retiring President, James F. Robertson, M.D., by V. K. Hart, M.D., Charlotte.

8:15 P.M.—Presentation of Sesquicentennial Celebration Committee:
Wm. deB. MacNider, M.D., Chapel Hill
Paul H. Ringer, M.D., Asheville
Donnell B. Cobb, M.D., Goldsboro
Wm. deB. MacNider, M. D., Presiding

8:20 P.M.—A Century and a Half of Medicine in North Carolina—Hubert A. Royster, M.D., Raleigh.

8:40 P.M.—Then and Now — Hugh J. Morgan, M.D., Professor of Medicine and Physician-in-Chief to the Vanderbilt University Hospital, Nashville, Tennessee.

9:15 P.M.—Adjournment.

10:00 P.M.—President's Ball.

(Ballroom)

WEDNESDAY, MAY 11, 1949

8:00 A.M.—Registration Booth Opens.

SECOND GENERAL SESSION

(Ballroom)

Wednesday, May 11, 1949

9:00 A.M.—The Diagnosis and Management of Pre-eclampsia; Mild and Severe — Ledyard De Camp, M.D., Charlotte (From Section on Obstetrics and Gynecology).

9:20 A.M.—Gastric Carcinoma—C. Graham Reid, M.D., Charlotte (From Section on Practice of Medicine).

9:40 A.M.—Carcinoma of the Stomach—Clarence E. Gardner, M.D., Durham (From Section on Surgery).

10:00 A.M.—Public Health and the Medical Care Program—E. G. McGavran, M.D., Dean, School of Public Health, University of North Carolina, Chapel Hill (From Section on Public Health and Education).

10:20 A.M.—PANEL DISCUSSION.

The Medical Profession's Present-day Health Problems.

Moderator — Paul F. Whitaker, M.D., Kinston.

Members of Panel

J. W. R. Norton, M.D., State Health Officer, State Board of Health, Raleigh—10 minutes.

David A. Young, M.D., General Superintendent, State Hospital Board of Control, Raleigh—10 minutes.

Henry S. Willis, M.D., Superintendent of North Carolina State Sanatoria, McCain—10 minutes.

Fred C. Hubbard, M.D., Chairman of Rural Health Committee, Medical Society of the State of North Carolina, North Wilkesboro—10 minutes.

John R. Bender, M.D., General Practice, Winston-Salem—10 minutes.

William M. Coppridge, M.D., member, Medical Care Commission, Durham —10 minutes.

Discussion Leaders

E. H. Ellinwood, M.D., Health Director, Catawba - Lincoln - Alexander District Health Department, Newton —5 minutes.

George F. Bond, M.D., General Practice, Bat Cave—5 minutes.

J. Street Brewer, M.D., member, Medical Care Commission, Roseboro—5 minutes.

Coy C. Carpenter, M.D., Dean, Bowman Gray School of Medicine, Winston-Salem—5 minutes.

Wilburt C. Davison, M.D., Dean, Duke University School of Medicine, Durham—5 minutes.

W. Reece Berryhill, M.D., Dean, School of Medicine, University of North Carolina, Chapel Hill—5 minutes.

General Discussion from floor.

11:50 A.M.—Election of two members of State Board of Health for three year terms. (Dr. S. D. Craig's and Dr. W. T. Rainey's terms expire.)

11:55 A.M.—Awarding of prizes.

CONJOINT SESSION

(Ballroom)

Wednesday, May 11, 12:00 Noon

S. D. Craig, M.D., Winston-Salem, President of the State Board of Health, will preside over this meeting of the Medical Society of the State of North Carolina and the State Board of Health.

ALUMNI LUNCHEONS

Wednesday, May 11, 1:00 P.M.

Wake Forest College—T. W. Baker, M.D., President, Charlotte.
(East End of Dining Room)

Duke University—Eleanor B. Easley, M.D., President, Durham.
(Stag Room)

University of North Carolina—S. R. Taylor, M.D., President, Greensboro.
(Crystal Room)

2:30 P.M.—Second Meeting of House of Delegates (Small Card Room).

2:30 P.M.—Professional Sound Motion Pictures—The Early Diagnosis of Cancer—Division of Cancer Control, State Board of Health, Cancer Committee of the State Medical Society, and the North Carolina Division—American Cancer Society.
(Dutch Room)

SECTION ON SURGERY

(Large Card Room)

Wednesday, May 11, 2:30 P.M.

George L. Carrington, M.D., Burlington, Chairman

Subparietal Rupture of the Intestine Incident to Severe Abdominal Muscular Effort.
George R. Benton, Jr., M.D., Goldsboro.

Fractures of the Lower End of the Humerus in Children.
R. Beverly Raney, M.D., Durham.

Carcinoma of the Stomach.
Clarence E. Gardner, M.D., Durham (Before Second General Session, Wednesday, May 11).

Causes and Prevention of Thrombophlebitis and Phlebothrombosis.
J. T. Kerr, M.D., Wilson.

The Problem of Thrombophlebitis and Phlebothrombosis from the Medical Standpoint.
Edward S. Orgain, M.D., Durham.

Surgical Treatment of Phlebothrombosis and Thrombophlebitis.
H. H. Bradshaw, M.D., and Felda Hightower, M.D., Winston-Salem.

SECTION ON PRACTICE OF MEDICINE

(Ballroom)

Wednesday, May 11, 2:30 P.M.

R. Z. Query, Jr., M.D., Charlotte, Chairman

Useful Drugs in Geriatric Practice.
Arthur Freedman, M.D., Greensboro. Discussion opened by O. Norris Smith, M.D., Greensboro.

Panel Discussion on Congestive Heart Failure.
Eugene A. Stead, Jr., M.D., Professor of Medicine, Duke University, Durham, Moderator.

The Mechanism of Congestive Heart Failure.
A. T. Miller, Jr., M.D., The School of Medicine, University of North Carolina, Chapel Hill.

The Diagnosis of Congestive Heart Failure.
Robert L. McMillan, M.D., Bowman Gray School of Medicine, Winston-Salem.

The Dietary and Diuretic Management of Congestive Heart Failure.
Eugene A. Stead, Jr., Professor of Medicine, Duke University, Durham.

The Use of Digitalis Preparations in Congestive Heart Failure.
Edward S. Orgain, M.D., School of Medicine, Duke University, Durham. Questions and answers, 30 minutes.

Gastric Carcinoma.
C. Graham Reid, M.D., Charlotte. (Before Second General Session, Wednesday, May 11.)

SECTION ON GYNECOLOGY AND OBSTETRICS

(Pine Room)

Wednesday, May 11, 2:30 P.M.

Frank R. Lock, M.D., Winston-Salem, Chairman

Panel Discussion on Toxemia of Pregnancy.
R. A. Moss, M.D., Durham, Moderator.

Prenatal Care in a Rural Area.
H. Fleming Fuller, M.D., Kinston.

Management of Hypertensive Cardiovascular Disease and Renal Disease Complicating Pregnancy.
Mary I. Griffith, M.D., Bowman Gray School of Medicine, Winston-Salem.

The Diagnosis and Management of Pre-eclampsia; Mild and Severe.
Ledyard DeCamp, M.D., Charlotte (Before Second General Session, Wednesday, May 11).

Management of Eclampsia; Convulsions and Coma.
John C. Burwell, Jr., M.D., Greensboro.

SECTION ON NEUROLOGY AND PSYCHIATRY

(Community Church)

Wednesday, May 11, 2:30 P.M.

John S. McKee, Jr., M.D., Morganton, Chairman

Neuropsychiatry and Private Practice.
Robert L. Garrard, M.D., Greensboro.

Successful Leucotomy in a Twelve-Year-Old Compulsive-Obsessive Boy Previously Diagnosed as Schizophrenic.
Leslie B. Hohman, M.D., Duke University, Durham.

Favorable Mental and Motor Changes Produced by Prefrontal Leucotomy in a Patient Showing Double Athetosis with Pfropfschizophrenia with Observation of Electrically Induced Convulsions Before and After Operation.
Guy L. Odom, M.D., Division of Neurosurgery, Duke University School of Medicine, Durham.
R. Burke Suitt, M.D., Department of Neuropsychiatry, Duke University School of Medicine, Durham.
R. Charman Carroll, M.D., Highland Hospital, Asheville.

The Effects of Lobotomy as Observed in a North Carolina State Hospital.
Sarah E. Glass, M.D. State Hospital at Raleigh.

Recent Advances in the Treatment of Neurosyphilis.
Augustus S. Rose, M.D. (by invitation), Boston, Mass. (Before First General Session, Tuesday, May 10).

SECTION ON PATHOLOGY

(Theater)

Wednesday, May 11, 2:30 P.M.

E. D. Peasley, M.D., Asheville, Chairman
John C. Reece, M.D., Morganton, Secretary

Problems in Medical Legal Investigation in North Carolina.
Wiley D. Forbus, M.D., Duke University School of Medicine, Durham (Before First General Session, Tuesday, May 10).

Obstruction of the Aqueduct of Sylvius as a Cause of Acute Hydrocephalus and Death.
C. C. Carpenter, M.D., and Peter H. Dillard, M.D., Department of Pathology, Bowman Gray School of Medicine, Winston-Salem.

The Clotting Defect in Hemophilia.
John B. Graham, M.D., and Kenneth M. Brinkhous, M.D., Department of Pathology, University of North Carolina, School of Medicine, Chapel Hill.

Carcinoma Arising from Endometriosis of the Ovary.
Lee Large, M.D., Pathological Laboratory of Charlotte Memorial Hospital, Charlotte.

The Role of Infection in the Production of Periarteritis Nodosa in Hypertensive Rabbits.
George Kipkie, M.D., Department of Pathology, Duke University School of Medicine, Durham.

THIRD GENERAL SESSION

(Ballroom)

Wednesday, May 11, 1949

5:00 P.M.—Report of House of Delegates
5:15 P.M.—Unfinished Business
5:20 P.M.—New Business.
5:30 P.M.—Installation of President, President-Elect, Vice Presidents, and Councilors.
5:40 P.M.—Remarks by President and President-Elect.
5:50 P.M.—Adjournment Sine Die.

SCIENTIFIC EXHIBITS

The Physician in the U. S. Public Health Service.
U. S. Public Health. Author: Eugene J. Gillespie, Surgeon. Exhibitor: same.

Parenteral Proteins in Surgery.
George Washington Medical School — Gallinger Hospital, Washington, D. C. Author: Jacob J. Weinstein, Washington, D. C. Exhibitor: same.

Injuries of the Carpal Bones.
Dept. Roentgenology, University of Virginia Hospital, University, Va. Authors: George Cooper, Jr., M.D., and Charles Frankel, M.D. Exhibitors: same.

Surgical Emergencies of the Newborn.
Dept. Roentgenology University of Virginia Hospital, University, Va. Authors: Herbert Hebel, M.D., and McLemore Birdson, M.D. Exhibitor: same.

Impaired Venous Circulation.
Author: J. Ross Veal, M.D., Washington, D. C. Exhibitor: same.

A. Tinea Capitis in North Carolina.
Duke University School of Medicine, Durham, N. C., (authors not to be stated). Exhibitor: Carlyle Adams, M.D., Durham, N. C.

B. Foreign Bodies in the Lungs of Children.
Department of Pediatrics. Exhibitor: Carlyle Adams, M.D., Durham, N.C.

Blue Cross-Blue Shield.
North Carolina Hospital Saving Association, Chapel Hill. Author: Louis M. Connor, Jr., Director of Public Relations, Chapel Hill, N. C. Exhibitor: same.

Vitamin Requirements in Health and Disease.
Wake Forest College, Bowman Gray School of Medicine, Winston-Salem, N. C. Author: David Cayer, M.D., Winston-Salem, N. C. Exhibitor: same.

The National Blood Program.
American Red Cross, Washington, D. C. Author: W. H. Stimpson, Art and Exhibit Section, Washington, D. C. Exhibitor: same.

The Diagnosis and Treatment of Skeletal Lesions.
Authors: Irvin Stein, M.D., and Raymond O. Stein, M.D., Philadelphia, Pa. Exhibitors: same.

Leg Length Discrepancies with Their Treatment.
Shriners' Hospital for Crippled Children and National Foundation for Infantile Paralysis. Authors: J. Warren White, M.D., Greenville, S. C., and Walter A. Hoyt, Jr., M.D., and Jack C. Hughston, M.D., Fellows N. F. I. P., Duke University Hospital, Durham, N. C. Exhibitors: same.

The Dairy Council's Services to Professional Groups.
The N. C. Units of the National Dairy Council, Durham, N. C., Mrs. Bessie Starling Ware, Director, Durham, N. C.

North Carolina State Board of Health Services.
North Carolina State Board of Health, Raleigh, N. C.

Venereal Disease Control.
N. C. Social Hygiene Society, Horace Holmes, P. H. Representative, Division Local Health-Venereal Disease Control, U. S. Public Health Service, Raleigh, N. C., Mrs. Margaret Barrow and Miss Grey Fulghum, Field Representatives, N. C. Social Hygiene Society, Raleigh, N. C.

Vocational Rehabilitation for Civilians.
N. C. Department Vocational Rehabilitation and Office of Vocational Rehabilitation, Federal Security Agency. Author: W. Oliver Kincannon, Chief, Office of Vocational Rehabilitation, Federal Security Agency. Exhibitor: C. L. Haney, Supervisor Physical Restoration, N. C. Dept. Voca. Rehabilitation.

Early Ambulation After Surgery and Inguinal Herniorrhaphy for Indirect Inguinal Hernia.
Author: Ernest T. Trice, M.D., Richmond, Va. Exhibitor: same.

TECHNICAL EXHIBITORS
1949

A. S. Aloe Co., St. Louis, Mo., spaces 77 and 78
Ayerst, McKenna & Harrison, New York, N. Y., space 65
Baker Laboratories, Cleveland, Ohio, space 29
The Borden Co., New York 17, N. Y., spaces 12 and 13
Bilhuber-Knoll Corp., Orange, N. J., spaces 89 and 90
Camel Cigarettes, New York 17, N. Y., spaces 2, 3, 4 and 5
Carnation Co., Oconomowoc, Wis., space 28
Carolina Surgical Supply Co., Raleigh, N. C., spaces 66 and 67
Ciba Pharmaceutical Products, Summit, N. J., spaces 106 and 107
Davies, Rose & Co., Boston, Mass., spaces 51 and 52
Doak Co., Inc., Hyattsville, Md., space 62
Doho Chemical Corp., New York 13, N. Y., spaces 34 and 35
Drug Specialties, Winston-Salem, N. C., space 11
Eaton, Inc., Norwich, N. Y., spaces 94, 95 and 96
Endo Products Inc., Richmond Hill, N. Y., space 48
H. G. Fischer & Co. Franklin Park, N. Y., spaces 21 and 22
C. B. Fleet Co., Lynchburg, Va., space 97
General Electric X-ray Corp., Charlotte, N. C., spaces 40 and 41
J. E. Hanger, Inc., Raleigh, N. C., spaces 19 and 20
Charles C. Haskell & Co., Richmond, Va., spaces 38 and 39
Hoffman-La Roche, Inc., Atlanta, Ga., spaces 63 and 64
Lanteen Medical Laboratories, Inc., Chicago, Ill.
Lederle Laboratories, New York, N. Y., spaces 53 and 54
Libel-Flarsheim Co., Cincinnati, Ohio, spaces 23, 24, and 25
Eli Lilly & Co., Indianapolis, Ind., spaces 32 and 33
M. & R. Dietetic Laboratories Inc., Columbus, Ohio, space 55
Mead Johnson & Co., Evansville, Ind., space 81
Wm. S. Merrell Co., Cincinnati, Ohio, spaces 42 and 43
The National Drug Co., Philadelphia, Pa., spaces 9 and 10
Ortho Pharmaceutical Corp., Linden, N. J., spaces 82 and 83
Parke, Davis & Co., Detroit, Mich., spaces 68 and 69
Picker X-ray Corp., Charlotte, N. C., spaces 30 and 31
Powers & Anderson Surgical Instrument Co., Norfolk, Va., spaces 49 and 50
Raleigh Hearing Aid Co., Raleigh, N. C., space 8
L. & B. Reiner, New York, N. Y., spaces 91, 92, and 93
S. & H. X-ray Corp. Charlotte, N. C., spaces 79 and 80
W. B. Saunders Co. Philadelphia, Pa., space 1
G. D. Searle & Co., Chicago, Ill., spaces 75 and 76
Smith, Kline & French Labs., Philadelphia, Pa., space 72
E. R. Squibb & Sons, New York, N. Y., spaces 36 and 37
Tablerock Laboratories, Inc., Greenville, S. C., space 6
U. S. Vitamin Corp., New York, N. Y., space 45
Universal Products Corp., Norristown, Pa., space 98
VanPelt & Brown, Inc., Richmond, Va., spaces 70 and 71
Winchester Surgical Supply Co., Charlotte, N. C., spaces 59, 60, and 61
Winchester-Ritch Surgical Co., Greensboro, N. C., spaces 56, 57, and 58
Winthrop-Stearns, Inc., New York, N. Y., spaces 26 and 27
World Insurance Co., Winston-Salem, N. C., space 7
Zimmer Manufacturing Co., Charlotte, N. C., space 44

DOCTOR WANTED

Doctor wanted to take over well equipped, eight-room doctor's office, with well established practice in eastern North Carolina town of 3000 population. Eighteen miles distant from modern hospitals on route 301, south.

If interested, write

Harrison Drug Company
Enfield, N. C.

NEWS NOTES FROM THE DUKE UNIVERSITY SCHOOL OF MEDICINE

Duke Hospital conducted a clinic for paraplegic patients on March 26. The clinic, directed by Dr. Lenox D. Baker, professor of orthopaedic surgery, was held in cooperation with the North Carolina Industrial Commission, at the request of T. A. Wilson, chairman.

Designed to further the work now being done at Duke, the clinic was directed at the rehabilitation of amputees and patients with paralysis following damage to the spinal cord caused by fractures of the spine, gunshot wounds and other wounds. Some 15-20 paraplegic patients were studied, and will form a nucleus for further studies of similar patients.

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Dr. Robert J. Reeves, director of the Department of Radiology and professor of radiology, read a paper on "Radiological Diagnostic Problems in the Study of Rectal Bleeding" to the Montgomery County Medical Society, District of Columbia, on March 15.

NEWS NOTES FROM THE UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE

The following members of the faculty attended the meeting of the American Association of Anatomists in Philadelphia on April 13, 14, and 15: Dr. W. C. George, Dr. C. D. Van Cleave, Dr. C. T. Kaylor, Dr. A. V. Jensen, and Dr. W. C. Doust. Dr. Van Cleave presented a paper on "A Radioautographic Study of the Localization of Radioactive Europium in Certain Soft Tissues of the Rat."

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Faculty members attending the Detroit meetings of the Federation of American Societies for Experimental Biology, April 18-22, were Drs. K. M. Brinkhous, John B. Graham, and Joseph A. Buckwalter of the Department of Pathology, Drs. John H. Ferguson, A. T. Miller, and Edwin P. Hiatt of the Department of Physiology, Dr. H. D. Bruner of the Department of Pharmacology, and Dr. G. C. Kyker and Mr. M. K. Berkut of the Department of Biological Chemistry.

Papers presented before the meetings were:

Dr. John H. Ferguson, "Significance of Activation of Prothrombin in Serum."

Dr. Edwin P. Hiatt, "The Antagonism of Cinchona Alkaloids to the Circulatory Effects of Intravenous Epinephrin."

Dr. H. D. Bruner (with Dr. Kwang Soo Lee), "Adrenergic-like Action of Acetylcholine on the Isolated Rabbit Heart."

Dr. G. C. Kyker (with S. L. Steelman), "Certain Organic Anions and Amide and Peptide Linkages."

Dr. John B. Graham (with Joseph A. Buckwalter, L. J. Hartley, and K. M. Brinkhous), "Canine Hemophilia: The Clotting Anomaly and the Effectiveness of Transfusions."

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The U. S. Atomic Energy Commission has agreed, as of April 1, to support the research project of Dr. C. D. Van Cleave and Dr. C. T. Kaylor, of the Department of Anatomy, at the rate of $30,000 for the first year. The project is a radioisotopic study of the distribution and retention of beryllium in laboratory animals.

Dr. Isaac F. Harris recently presented to the University a portrait of his father, Dr. Thomas West Harris, who was the first dean of the School of Medicine. The portrait, done by Deane Keller, professor of painting in the Yale School of Fine Arts, has been hung in the Medical Library.

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Dr. William G. Lennox, associate professor of neurology at the Harvard Medical School, addressed the Whitehead Medical Society and the Medical Faculty on March 24 on "Epilepsy."

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A postgraduate medical course sponsored by the University School of Medicine and the Extension Division has been arranged at North Wilkesboro and Elkin, with the Wilkes-Alleghany Counties Society and the Surry-Yadkin Counties Society as co-sponsors. The program is as follows:

April 5 (North Wilkesboro)
4:00 p.m.) Diagnosis and Treatment of Neurologic
8:00 p.m.) Problems Seen in General Medical Practice—Dr. H. Houston Merritt, Columbia University College of Physicians and Surgeons, New York City

April 12 (Elkin)
4:00 p.m. The Management of Some Unusual Complications in Pregnancy
8:00 p.m. Diagnosis and Treatment of Ectopic Pregnancy
—Dr. H. Hudnall Ware, Jr., Medical College of Virginia, Richmond.

April 19 (North Wilkesboro)
4:00 p.m. Rheumatic Fever in Children
8:00 p.m. Rheumatic Heart Disease in Children
—Dr. John P. Hubbard, Children's Hospital, Philadelphia.

April 26 (North Wilkesboro)
4:00 p.m.) Methods of Decreasing the Risk of Sur-
8:00 p.m.) gery in Older Patients
—Dr. W. E. Burnett, Temple University School of Medicine, Philadelphia.

May 3 (Elkin)
4:00 p.m.) Differential Diagnosis of Cancer of Pan-
8:00 p.m.) creas and Ampullary Area; Clinical and Laboratory Methods
—Dr. Allen O. Whipple, Memorial Hospital, New York City (N. C. Division of American Cancer Society, co-sponsor)

May 10—No meeting. Week of State Medical Society meeting.

May 17 (North Wilkesboro)
4:00 p.m. Essentials of Physical Diagnosis
8:00 p.m. Gastrointestinal Problems
—Dr. L. A. M. Krause, University of Maryland School of Medicine, Baltimore.

News Notes from the Bowman Gray School of Medicine

Dr. Arthur Valk, of the department of surgery, was elected president of the Association of Surgeons of the Southern Railway System at a meeting held in Cincinnati in March.

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Dr. Frank R. Lock, head of the department of obstetrics and gynecology, was elected to membership in the American Society of Obstetricians, Gynecologists, and Abdominal Surgeons at a recent meeting of the council. He was guest speaker on April 18 at the meeting of the Alabama State Obstetrical and Gynecological Society on the subject of "Conservatism in the Management of Gynecological Patients."

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Dr. Harold D. Green, head of the department of physiology and pharmacology, attended a meeting of the scientific board of the American Foundation for High Blood Pressure in Cleveland, Ohio, April 15-16.

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Members of the department of physiology and pharmacology presented four papers and members of the department of biochemistry presented three papers at the meeting of the American Physiological Society in Detroit, April 19-22. Papers from the department of physiology and pharmacology were prepared by Dr. Green, Dr. J. Maxwell Little, Lewis Franklin, Howard Wayne, Dr. Alan B. Denison, and Miss June Harris. Dr. Green and Dr. Little participated in a symposium on kidney functioning at a meeting of the circulation section of the society.

Those who attended the meeting from the department of biochemistry were Dr. Camillo Artom, Dr. W. E. Cornatzer, Dr. Marjorie Swanson, and Miss Marietta Crowder.

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Postdoctoral fellowships granted by the Atomic Energy Commission have been renewed for another year to Dr. Kingsley M. Stevens and Dr. Jerry Aikawa, both of whom are doing research with radioisotopes in the department of medicine. Dr. Stevens, who is studying the synthesis of protein by bacteria will continue his work at the University of Chicago after September. Dr. Aikawa's grant is for research on the alteration in the distribution of body fluids in infectious diseases.

Work has been started on a new isotope laboratory, to occupy the top floor of the medical school's east wing.

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Grants totaling $51,802 have been approved recently for various departments of the Bowman Gray School of Medicine. All are from the U. S. Public Health Service, with the exception of one from the Markle Foundation.

A grant of $25,000 made to the department of physiology and pharmacology will provide funds for further study and experimentation on the usefulness of various new drugs in the treatment of peripheral vascular disease and other circulatory disturbances. A grant of $4,320 to the department of internal medicine is for further study in alterations of permeability of membranes in infectious diseases. The department of medicine also received a grant of $5,929 for research in factors concerned in reaction to chemotherapy and shares with the department of biochemistry a grant of $5,940 for research on liver disease using radioisotopes. Dr. R. V. Postlethwait of the department of surgery was recipient of a grant of $3,613 for further study in wound healing.

The Markle grant of $7,000 to the department of medicine is for continued study on the alteration in body functions caused by spotted fever and typhus, and on factors possibly producing positive trichinella skin tests in the absence of infection.

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Dr. Richard A. Groat, director of the department of anatomy, presented a paper at the sixty-second session of the American Association of Anatomists held in Philadelphia at the invitation of Temple University School of Medicine, April 13-15. The title of his paper was "Temporal and Spatial Characteristics of Histological Changes in Peripheral Nerve Axons during Secondary Degeneration."

Progress reports on two research projects being carried on at the Bowman Gray School of Medicine were made at the Second National Symposium on Recent Advances in Antibiotics Research, held in Washington, D. C., April 11 and 12.

"A Comparative Study of the Effects of Aureomycin and Penicillin on Pharyngeal Flora of Normal Human Beings" was the title of the paper prepared by Dr. Manson Meads, Dr. Wallace T. Rowe and Miss Nancy M. Haslam of the department of medicine. A paper on "Observations on Tuberculous Meningitis Treated with Oral Aureomycin" was prepared by Drs. George T. Harrell and Manson Meads, of the department of medicine; Dr. Robert Lawson, associate professor of pediatrics; and Dr. Thomas N. Lide, instructor in pathology.

News Notes from the State Board of Health

As of July 1, every county in North Carolina will have an organized public health department, according to an announcement made by Dr. J. W. R. Norton, State Health Officer. The last, and one hundredth, county to join up for full-time local health work is Pamlico, which will be in a district with either Craven or Beaufort County.

On January 1, this year, there were ninety-six counties with full-time public health departments, leaving only four to make the number 100 per cent. Jones joined with Lenoir, Brunswick with Columbus, and Madison with Buncombe. The action of the Pamlico County Commissioners in voting to establish a county health department not only rounds out one hundred counties, but fulfills a dream of long standing on the part of those sponsoring public health activities in this state.

Dr. Norton, since taking office last July 1, has emphasized the importance of local health work, taking the position that public health is a matter for the grass roots.

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Dr. J. W. R. Norton, North Carolina State Health Officer, will lead a discussion on "The Tax Dollar in Public Health," before the second general session of the Southern Branch of the American Public Health Association, in Dallas, Texas, on April 14. Later that same afternoon, Dr. Edward G. McGavran, dean of the School of Public Health at Chapel Hill, will participate in a panel discussion on the subject, "The Importance of Immediate Personnel Policy Planning."

One of the vice presidents of the Southern Branch of the American Public Health Association is Dr. Lucy Morgan of Chapel Hill, who played a prominent part in laying the groundwork for this organization.

News Notes from the North Carolina Tuberculosis Association

The Health Education Service of the National Tuberculosis Association sponsored a five-day Working Conference in Health Education at the University of North Carolina, March 27-April 1.

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The 1949 meeting of the Southern Tuberculosis Conference will be held in Memphis, Tennessee, September 15-17. Hotel reservations should be made directly with the Peabody Hotel.

Carteret County Medical Society

Regular monthly meetings of the Carteret County Medical Society were held at the Morehead City Hospital, February 14, and March 14.

At the February meeting it was reported that the Society's invitation to the Second District Medical Society, to meet next year in Morehead City, had been accepted. The new president of the District Society is Dr. W. S. Thompson, Morehead City, and the new secretary is Dr. L. W. Moore, Beaufort.

At the March meeting, the chief items discussed were the x-ray follow-up program, after the mass x-ray survey is concluded, and the matter of the use of immune globulin in the control of measles.

At the Beaufort Rotary Club on March 15, Dr. F. E. Hyde, president of the Carteret County Medical Society, discussed "Political Medicine." His talk was favorably received.

Reported by N. Thomas Ennett, M.D.,
Corresponding Secretary

Edgecombe-Nash Counties Medical Society

A motion picture on "Management of the Failing Heart" was shown to the Edgecombe-Nash Counties Medical Society at its meeting in Rocky Mount on March 9.

Forsyth County Medical Society

The Forsyth County Medical Society met with the Trudeau Society in Winston-Salem on April 18.

Halifax County Medical Society

Dr. T. F. Adkins of Durham spoke on "Abnormal Uterine Bleeding" at a dinner meeting of the Halifax County Medical Society, held in Roanoke Rapids on April 8.

News Notes

Dr. Frederick A. Blount has announced the opening of offices at College Village in Winston-Salem. His practice will be limited to the care of infants and children.

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Dr. S. F. Horne has opened offices in the New Ricks Hotel Building, Rocky Mount, for the practice of dermatology and syphilology.

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Dr. Sam E. Way has announced his association with Drs. M. L. Stone and O. E. Bell in the Speight-Stone-Bell Clinic in Rocky Mount. His practice will be limited to general surgery.

American Cancer Society

A new film, titled "Cancer: The Problem of Early Diagnosis," which has received the approval of the American Medical Association's Committee on Medical Motion Pictures, was made available to the medical profession recently through more than fifty state and regional distributing points.

Through the efforts of its co-sponsors, the American Cancer Society and the National Cancer Institute of the United States Public Health Service, prints for single showings may be borrowed from State Cancer Society offices, State Health Departments, and four regional offices of Association Films located in New York City; Chicago, Illinois; Dallas, Texas; and San Francisco, California.

The film, designed for general practitioners, is based on the premise that if cancer were diagnosed early and effectively treated the death rate might be reduced by almost 50 per cent.

"Cancer: The Problem of Early Diagnosis" is the first in a series of six films to deal with the subject. The succeeding five, to be released within the next two years, will deal with diagnosis of cancer by specific body site.

Cook County Graduate School of Medicine

The Cook County Graduate School of Medicine of Chicago has arranged two courses that will be of special interest to some of the members of the North Carolina medical profession. A two weeks' intensive personal course in the "Diagnosis and Treatment of Congenital Malformations of the Heart" will be offered by Benjamin M. Gasul, M.D. starting Monday, June 13. A two weeks' intensive personal course in "Cerebral Palsy" will be offered by M. A. Perlstein, M.D. starting Monday, August 1. These physicians are members of the attending staff of the Cook County Hospital.

Course in Gastrointestinal Surgery

The National Gastroenterological Association, in cooperation with the Postgraduate Division of Tufts College Medical School and the First and Second Surgical Services of the Boston City Hospital, announces a course in gastrointestinal surgery to be given at the Boston City Hospital, Boston, on October 27, 28, 29, 1949.

The course will cover various phases of gastrointestinal surgery. It will be under the personal direction of Dr. Owen H. Wangensteen, professor of surgery, University of Minnesota Medical School, assisted by Lord Alfred Webb-Johnson, president of the Royal College of Surgeons, London, England, and the members of the surgical staff of the Boston City Hospital, as well as other distinguished guests.

Enrollment in the course is limited to 250. The fee will be $35.00 per person. Veterans may take this course under the G. I. Bill of Rights.

For further information and enrollment, write to the National Gastroenterological Association, Dept. GSJ, 1819 Broadway, New York 23, N. Y.

American Association of Railway Surgeons

The sixty-first annual meeting of the American Association of Railway Surgeons will be held at the Drake Hotel, Chicago, Illinois, June 30-July 2, 1949. The morning sessions will include twelve papers on various medical and surgical subjects, given by outstanding authorities. The two afternoon sessions will be devoted to symposia on "Lesions of the Bones and Joints" and "Intrathoracic Disorders." The annual dinner will be held at the Drake Hotel on Friday evening, July 1, 1949. There will be a technical exhibit in conjunction with the scientific meetings.

Room reservations may be made at the Drake Hotel or at the nearby Knickerbocker Hotel.

International Congress on Rheumatic Diseases

The current interest in arthritis and the other rheumatic diseases will receive additional impetus when several hundred physicians from the United States and foreign countries gather at the Waldorf Astoria in New York for the seventh International Congress on Rheumatic Diseases from May 10 to June 3. This Congress is sponsored and supported by several organizations, including the American Rheumatism Association, the United States Public Health Service, and the Arthritis and Rheumatism Foundation, the latter being established only in 1948.

Inquiries concerning registration, the complete program, and other aspects of the Congress can be addressed to Mr. Robert D. Potter, Executive Director, 535 Fifth Avenue, New York, New York.

(BULLETIN BOARD CONTINUED ON PAGE 228)

AUXILIARY

MRS. J. B. SIDBURY

Mrs. J. B. Sidbury died October 23, 1948, in Wilmington. With her passing, the Auxiliary lost one of its most loyal and stalwart members. For many years, Mrs. Sidbury gave of her abilities and personality to enrich the program of the Auxiliary. She leaves, therefore, a treasury of pleasant memories for its entire membership. Tact, consideration, cheerfulness, enthusiasm, dependability, and humility, all of a high degree, characterized her work. To these she added a host of capabilities and a forthrightness which won our admiration and respect.

Willie Daniel Sidbury was born in the Methodist parsonage at York, South Carolina, where her father and mother, Reverend and Mrs. W. W. Daniel, were serving. She was graduated from Columbia College in Columbia, South Carolina, while her father was president of that institution. It was while she was doing graduate study at Columbia University in New York City that she met Dr. J. B. Sidbury, who was at Physicians' and Surgeons' Hospital. They were married in 1918. Since that time they have lived in Wilmington. It may be said that, while Wilmington remained home to this fine couple, they both belonged to the entire state.

Mrs. Sidbury's interests were wide and varied. She took an active part in all forward looking civic and cultural programs. Perhaps her greatest contributions were made as President of the State Parent-Teacher Association, of the State Garden Clubs, and of the Auxiliary to the Medical Society of the State of North Carolina.

During World War II, despite failing health, she was active in war service . . . receiving special recognition for her work with Red Cross volunteers in the armed services' hospitals in the eastern North Carolina area.

She was, without doubt, the most sought after woman in North Carolina on matters of parliamentary procedure. It seemed that every organization needed her advice and counsel. She found herself heading many a constitution and by-laws committee!

All of us who knew her and had the privilege of working with her will miss, sorely, her guidance and counsel at future Auxiliary meetings. In truth, it will be hard to think

of an Auxiliary meeting without Mrs. Sidbury. Her winning smile, that comfortable feeling, once she arrived, that all was well were so apparent to every one except Mrs. Sidbury herself!

But she would have us go forward! She would have us strive to bring to fruition, more fully than ever before, the objectives of our Auxiliary—the objectives for which she gave so deeply of her energy, interests, and capacities. Having carried, throughout her entire married life, the banner of higher aims and attainments for our Auxiliary, Mrs. Sidbury, in passing that banner to those of us remaining, shall be most honored, most revered, and most sincerely mourned by our receiving it in its true sense and keeping it aloft always!

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TWENTY-SIXTH ANNUAL MEETING OF THE AUXILIARY TO THE MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA

RULES AND PROCEDURE

1. Register on arrival and receive badge ($2.00—fifty cents for Auxiliary expense and one dollar due to Auxiliary of A. M. A., and fifty cents for upkeep of three beds at State Sanatoria maintained for doctors, doctors' families, nurses, children, others, preference in order given—fee for all who do not present current membership card). Wear badge to all functions.
2. Register for Bridge Party.
3. Secure luncheon ticket.

Guests registered at Carolina Hotel attending luncheon notify cashier at Hotel prior to 11:00 A. M. to obtain a luncheon credit ticket. Those registered at Holly Inn get transfer tickets at Holly Inn Desk before 10:00 A.M. These tickets will be accepted at Country Club. All not having transfer tickets will pay $2.00 at the Country Club. Special table for Past Presidents.

PROGRAM

MONDAY, MAY 9TH

8:30 P.M.—Bingo Party — Pine Room — Mrs. George Heinitsh, Chairman.

TUESDAY, MAY 10th

9:00 A.M.—Executive Board Meeting — Pine Room.

10:30 A.M.—Annual Meeting — Pine Room.

1:00 P.M.—Luncheon—Pinehurst Country Club—Mrs. W. F. Hollister, Chairman.

4:00 P.M.—Tea—West Parlor—Mrs. Paul McCain, Chairman.

WEDNESDAY, MAY 11TH

10:00 A.M.—Bridge Party (Large Card Room)—Mrs. R. M. McMillan, Chairman.

GENERAL MEETING

Tuesday, May 10th—10:30 A.M.

Pine Room

Mrs. Raymond Thompson, President, Presiding

PROGRAM

Call to order ..... Mrs. Raymond Thompson, Charlotte
Invocation ..... Mrs. Joseph A. Elliott, Charlotte
Address of Welcome ..... Mrs. W. F. Hollister, Southern Pines
Response ..... Mrs. G. M. Billings, Morganton
Memorial Service ..... Mrs. H. H. Foster, Norlina
Reports of Executive Officers
First Vice-President
Chmn. of Organization ..... Mrs. W. Reece Berryhill, Chapel Hill
Second Vice-President
Chairman of Activities ..... Mrs. M. D. Hill, Raleigh
Corresponding Secretary ..... Mrs. Charles H. Gay, Charlotte
Recording Secretary ..... Mrs. David Cayer, Winston-Salem
Treasurer ..... Mrs. E. C. Judd, Raleigh
President ..... Mrs. Raymond Thompson, Charlotte
Report of Chairman of Advisory Board ..... Dr. Rachel Davis, Kinston
Report of Chairman of Revision Committee ..... Mrs. Robert T. Pigford, Wilmington
Greetings from Medical Society of the State of North Carolina ..... Dr. J. F. Robertson, Wilmington
Presentation of Davis Cup
Unfinished Business
New Business
Election of Delegates to National Auxiliary
Report of Nominating Committee ..... Mrs. Ben H. Kendall, Shelby
Installation of Officers ..... Mrs. W. Reece Berryhill, Chapel Hill
Presentation of Gavel
Inaugural Remarks ..... Mrs. Thomas Leslie Lee, Kinston
Announcements
Adjournment

MOORE COUNTY AUXILIARY HOSTESSES

Mrs. James S. Milliken, President ..... Southern Pines
Mrs. A. A. Vanore, Vice-President ..... Southern Pines
Mrs. R. M. McMillan, Secretary-Treasurer ..... Southern Pines
Mrs. P. P. McCain, General Chairman ..... Southern Pines
Mrs. H. E. Bowman ..... Aberdeen
Mrs. Wm. F. Hollister ..... Southern Pines
Mrs. George Heinitsh ..... Southern Pines
Mrs. M. T. Pishkoe ..... Southern Pines
Mrs. R. G. Rosser ..... Vass
Mrs. C. E. Brady ..... Robbins
Mrs. W. M. Marr ..... Pinehurst
Mrs. J. C. Grier ..... Pinehurst
Mrs. Malcolm Kemp ..... Southern Pines
Mrs. Charles Grier ..... Carthage

SPECIAL GUESTS COMMITTEE

Mrs. Edward R. Hipp ..... Charlotte
Mrs. John P. Kennedy ..... Charlotte
Mrs. Charles L. Nance ..... Charlotte
Mrs. Walter Summerville ..... Charlotte

* * *

A. M. A. CONVENTION

The American Medical Association meets June 6-10 in Atlantic City, New Jersey. Haddon Hall will be headquarters. All Auxiliary members who are planning to attend are asked to notify Mrs. Raymond Thompson, 240 Cherokee Road, Charlotte, N. C., so that she may send them a registration card.

"It is to be hoped that this little volume will have a wide circulation."
—*North Carolina Medical Journal*

The Case Against Socialized Medicine

By Lawrence Sullivan

"A book of far-reaching significance."
—*Journal of Insurance Medicine*

"His arguments against Socialized Medicine are worthy of the tax-payers' study."
—*New Bedford Standard*

"The chapter on pre-fabricated statistics will prove an eye-opener."
—*Chicago Tribune*

". . . large type, well written, easy to read."
—*Illinois Dental Journal*

"He has brought out the fact that the Government is one of the prime promoters of Socialized Medicine."
—*Charles P. Ryland, M.D*

"An important contribution."
—*South Bend Tribune*

"Outlines the opposition to Socialized Medicine with much pungency, and many hard-hitting punches."
—*The Spectator*

"The chief fault is that it is so brief. You can read it through in half an hour."
—*Connecticut Medical Journal*

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BOOK REVIEWS

Methods in Medical Research, Volume 1. Edited by Van R. Potter. Price, $8.00. 372 pages. Chicago: The Year Book Publishers, 1948.

This volume, the first in a series, represents an intriguing departure in medical books. The authors have elected to review, periodically, the methods proposed for the solution of some experimental problem. Because of the frequent modifications and improvements worked out in laboratories and not published, and because the publication of methods in original articles appearing in many journals is severely restricted by space limitations, this series should serve a very useful purpose.

The current volume reviews four subjects: (1) assay of antibiotics; (2) circulation—blood flow measurement; (3) selected methods in gastroenterologic research; (4) cellular respiration. The techniques of assay for penicillin and streptomycin are given in detail, and can be readily followed in any laboratory. The survey of blood flow measurements is presented from the laboratory point of view in animals, and the application to disease in man is discussed. Individual articles in this section have been reviewed frequentiy by several people, and comments of the reviewers are appended. The section on gastroenterologic research is short and covers only three subjects: choleretic compounds, the Mann-Williamson dog, and gastric acidities in man. The section on cellular respiration discusses techniques for measuring oxygen consumption in intact small animals, as well as in tissue slices and tissue homogenates.

Bibliographies are included with each section. Graphs and monographs are included where they would be helpful. The volume would be useful in any research laboratory, but would be of limited value to students or practitioners.

Everyday Psychiatry. By John D. Campbell, M.D. Diplomate, American Board of Neurology and Psychiatry; Psychiatrist to St. Joseph's Infirmary and Crawford W. Long Hospital, Atlanta, Georgia. Ed. 2. 394 pages. Price, $6.00. Phialdelphia: J. B. Lippincott Company, 1949.

Those who read the first edition of Dr. Campbell's book will not be surprised to know that its success has justified a second edition, enlarged by sixty pages. What was said in the review of the first edition (North Carolina M. J. 7:41, Jan., 1946) is even more true of the second: "This book fulfills the expectations aroused by its name." The first edition was based largely upon the author's experience in dealing with service men; consequently most of his reports dealt with men. In the second edition much more attention is paid to the problems of civilian practice, and much new material has been added. The chapter on the psychoneuroses has been rewritten, and electroshock treatment is discussed. Some who have used insulin with good results in selected cases will perhaps object to the rather curt dismissal of this form of therapy in favor of electroshock.

The author has adhered to the principle of the first edition—telling the reader how to recognize and treat the psychoneurotic and mild psychiatric problems that are encountered in everyday practice.

The second edition of **Everyday Psychiatry** can be recommended even more heartily than the first to all practitioners who want to learn more about the psychiatric problems that confront them every day.

Atlas of Peripheral Nerve Injuries. By William R. Lyons, Ph.D., Associate Professor of Anatomy, University of California Medical School; and Barnes Woodhall, M.D., Professor of Neurosurgery, Duke Medical School, Durham, N. C. 339 pages. Price, $16.00. Philadelphia and London: W. B. Saunders Company, 1949.

In the early months of World War II, when efforts were made by those concerned with the care of peripheral nerve injuries to glean all the information possible from nerve injuries treated during World War I, it was all too obvious that the material had never been properly concentrated and analyzed. The collection of material from World War II was begun in those days by the Neurological Consultant to the Office of the Surgeon General of the Army, and, largely as a result of this work, the peripheral nerve injuries of World War II were subjected to intensive study by neurosurgeons, neuropathologists, neurophysiologists, and a host of other scientists working as teams in various neurosurgical centers.

The Atlas of Peripheral Nerve Injuries by Dr. Lyons and Dr. Woodhall is a forthright, detailed, authoritative compilation of this tremendous mass of data. Only an intensive interest and enthusiasm could have made possible the completion of this work. The authors have applied to this task an extensive scientific experience, and the monograph shows evidence of planning and careful selection of material, which make it useful to all those interested in this subject.

The text is well written in clear-cut English. It was written at a time when the war experience with peripheral nerve injuries could be evaluated with some objectivity, and after the work of men in other fields and in other countries was available for critical analysis. The discussion of "Completely Severed Nerves," dealing with the mechanics of injuries to the peripheral nerves, deserves special mention. A large mass of literature on this aspect of the problem has been condensed into a few pages, the reading of which leaves one with a clear concept of the problem. In a similar manner the section devoted to "Nerve Grafts" is an extremely lucid and impartial presentation of the facts.

The **Atlas** is profusely illustrated with more than 600 photographs, selected from a tremendous collection of such material available to the authors. The care with which these have been composed on each page to give a sense of symmetry and order to the entire publication should be a source of pride to both the authors and the publishers. The text is singularly free of typographical errors, and the volume is printed on excellent paper and well bound.

This book will be of special interest to neurosurgeons and those in other fields of surgery concerned with peripheral nerve injuries. It will become a standard reference for any study of this subject, and, taken as a companion piece to **Peripheral Nerve Injuries** by Haymaker and Woodhall, offers the most complete presentation of the subject now available.

Mayo Clinic Diet Manual. By the Committee on Dietetics of the Mayo Clinic. 329 pages. Price, $4.00. Philadelphia and London: W. B. Saunders Company, 1949.

Increased interest in the importance of dietotherapy for the maintenance of health and treatment of diseases has aroused considerable interest in the practical aspects of dietetics.

The Mayo Clinic manual is designed to provide the answer to the problem of feeding the patient who needs a special diet. Some thirty-five different diets are described. The principles of each diet, a general description, and, in many instances, methods for its preparation are given. Sample menus are carefully evaluated in terms of National Research Council vitamin requirements.

Most practicing physicians will be particularly interested in the diets used in the management of gastrointestinal disorders and cardiovascular renal disease. However, diets for the management of allergy, diabetes, obesity, underweight, and postoperative management, as well as diets for children and many others, are also included.

A forty-six page appendix includes a comprehensive table of food composition, vitamin supplements, and height-and-weight tables.

This book represents the results of careful clinical and laboratory research and sound practical experience. It emphasizes that the clinical diagnosis and correct choice of a diet still rest with the physician. It is a valuable source of information, and should be of interest and value to all students and practitioners of medicine.

The Business Side of Medical Practice. By Theodore Wiprud, Executive Director and Secretary of the Medical Society of the District of Columbia and Managing Editor of the **Medical Annals of the District of Columbia.** Ed. 2. 232 pages with 22 figures. Price, $3.50. Philadelphia and London: W. B. Saunders Company, 1949.

There are few, if any, men in the United States better qualified than Mr. Wiprud to write on the business side of medical practice. His long experience as executive director of the Medical Society of the District of Columbia has given him first hand knowledge of the problems of medical men. As managing editor of the **Medical Annals** he is thoroughly familiar with the problems of preparing medical papers for publication, and with the importance of a physician's being able to express himself in speaking or writing. Certainly, after living so long in Washington, he has learned how important it is for doctors, even those in private practice, to be interested in public affairs.

This book gives doctors much more than excellent advice about building a practice, managing an office, keeping books and records, and dealing with medicolegal problems. It deals with the preparation of manuscripts, public speaking, and relations with the press and the public. Among the best chapters are those dealing with medical meetings, group medical practice, and relations with other doctors.

The book can be heartily commended to any practicing physician. It should be of particular interest to North Carolinians, since Mr. Wiprud is the father-in-law of Dr. Isaac Manning, Jr., of Durham.

Clinical Case-Taking. By George R. Herrmann, M.D., Ph.D., Professor of Medicine, University of Texas. 240 pages. Price, $3.50. St. Louis: C. V. Mosby Company, 1949.

The author emphasizes that the art of medicine in large measure depends on the ability of the physician to interpret the complaints of the patient. He stresses the systematic method of history taking and a complete study of each individual patient. He stresses logical sequence and arrangement of data as a prerequisite to intelligent, accurate diagnosis.

After a general outline of history taking, the common chief complaints and the significant physical and laboratory findings apt to be associated are discussed. Special sections on history and physical examination outlines for surgical and pediatric cases are included.

This book is of value to students of physical diagnosis, to house officers, and to physicians for general review.

BULLETIN BOARD

(CONTINUED FROM PAGE 224)

National Society for Crippled Children and Adults

The Annual Convention of the National Society for Crippled Children and Adults will be held November 7, 8, and 9, at the Commodore Hotel in New York.

American Board of Orthopaedic Surgery, Inc.

The following change has been made in the regulations of the Board:

(2) EXAMINATION, Part I.

(a) Eligibility for Examination, Part I: Beginning in the year 1952 the minimum requirements for eligibility for examination, Part I, shall consist of completion of an internship; a year of resident training in general surgery and **two** years of resident training in orthopaedic surgery on an approved service.

Applicants filing in 1951 for examination, Part I, to be given in 1952 are subject to these minimum requirements.

American Academy of Neurology

The American Academy of Neurology, whose purpose it is to further and encourage the practice of clinical neurology and to stimulate teaching and research in neurology and allied sciences, has recently been established.

Active membership in the Academy is open to every physician who has been certified in neurology or in both neurology and psychiatry. Junior membership is available to physicians presently engaged in postgraduate studies in neurology or who are awaiting certification in neurology. In addition, there is an associate membership for those who are not certified in neurology but whose interests are in fields related to neurology.

The first scientific meeting will be held at the French Lick Springs Hotel, French Lick Springs, Indiana, on June 1, 2, and 3. Dr. Dave B. Ruskin of the Caro State Hospital, Caro, Michigan, is in charge of the scientific program.

Communications to the Academy should be addressed to Dr. Joe R. Brown, 19 Millard Hall, University of Minnesota, Minneapolis 14, Minnesota.

United States Atomic Energy Commission

Twenty-one new research projects in biology and medicine will be financed by the U. S. Atomic Energy Commission, under contract with sixteen universities and two hospitals. With the new contracts a total of seventy-eight research studies in biology and medicine are currently being financed by the Commission, in addition to the work being done at the major laboratories of the national atomic energy program.

Included in the twenty-one new projects are five in North Carolina: one at Duke University by Dr. Philip Handler, Office of Naval Research, on Metabolic Studies with Radioactive Isotopes; one at the University of North Carolina by Dr. C. P. Van Cleave and Dr. C. T. Kaylor, Oak Ridge Operations Office on Radioautographic Study of Beryllium 7; and three at North Carolina State College.

Life Insurance Medical Research Fund

Life insurance companies of the United States and Canada will contribute $680,000 during the coming year for the support of heart disease research, it was announced recently by M. Albert Linton, chairman of the Life Insurance Medical Research Fund. The awards raise to more than $2,500,000 the amount contributed by the companies since the Fund was started late in 1945. One award of $10,500 went to Duke University School of Medicine, for research by Dr. Walter Kempner on the effect of diet on mineral metabolism in renal and hypertensive disease.

Federal Security Agency

Federal agencies of the United States and Canada have joined to sponsor an across-the-border campaign to tell the story of cancer research—what it means, what it has accomplished, what directions it is taking—to the people of both countries. A half-hour documentary film, tentatively titled "The Scientist vs. Cancer," is described as the keystone of the new program.

* * * *

Appointment of Dr. James A. Shannon of the Squibb Institute for Medical Research, New Brunswick, New Jersey, to the National Heart Institute as Associate Director in charge of research was announced recently by Surgeon General Leonard A. Scheele of the Public Health Service.

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Research grants totaling $2,040,900 to finance medical and allied research projects at non-federal institutions in thirty states, Alaska, Puerto Rico, and the District of Columbia were announced recently by Oscar R. Ewing, Federal Security Administrator. The grants include two to the Bowman Gray School of Medicine of Wake Forest College, seven to Duke University, and three to the University of North Carolina.

Institute of Life Insurance

Three quarters of all the babies born last year will live to the age of 60 and one half will be alive at the age of 72, even if there is no further improvement in mortality. This is in marked contrast with the beginning of the century when, under the then prevailing mortality conditions, only three-quarters of those born at that time would live to the age of 24 and one-half would be alive at the age of 58.

This dramatic change in the nation's health environment was reported recently by Reinhard A. Hohaus, actuary, Metropolitan Life Insurance Company, in an editorial appearing in the **Wisconsin State Medical Journal.**

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